A Final Report to The Atomic
Energy Control Board

Regarding

Performance Indicators
For Nuclear Medicine
And Industrial Radiographers

Delivered by

HCA—Assessment Experts

Canada • Malaysia

E-mail drtdhill@gtn.net
Web http://www.gtn.net/users/drtdhill

http://www.HcaAssessmentExperts.com

Contents

Abstract/ Resumé

HCA—Assessment Experts (HCA) was retained under contract to provide evidence that a behaviourally-based approach to the development of performance indicators for radioisotope users could be successfully designed, implemented and rapidly delivered to a pilot sample. Moreover. HCA believed that it was uniquely qualified to not only achieve this success, but to show further that we could instill the motivation for self-improvement in the AECB inspection ratings of Licensees and Permit Holders.

In the space of about ten weeks. HCA was able to deliver a comprehensive set of web-based tools for performance indicators. Not only did we deliver these tools. but we also included such supplemental information as relevant legislation. regulations. Inspectors' preferences and recommendations. among others. so as to foster a learning component of the performance indicators tools.

The call for the continuation of this work is based on two sources. The response from participants to this project was very favourable – participants want these tools. Secondly, our research and experience have shown (and the larger body of empirical research also shows) that this is the type of performance feedback and communication that participants appreciate the most, and is the most predictive of successful compliance *and* improvement in the future.

RÉSUMÉ

HCA-Assesment Experts (HCS) était passer un contrat pour témoigner qu'une façon behavioriste au développment des compteur de fonctionnement pour un utilisateur de radio-isotope pourrait être bien conçu, il pourrait être exécuter et aussi il pourrait être céder rapidement pour une pré-série. En plus, nous à HCA croyons que ce compteur de fonctionnement ne peut seulement obtenir ce succès mais également montrer que nous pouvons pénétrere la motivation pour des progrès personnels de les évaluation AECB de titulaire.

Dans l'espace de dix semaines. nous à HCA pouvions livrer un série des outils basé au internet pour des competeur de fonctionnement. Nous non seulment livrer ces outils mais égalment des documents justificatif étaient compris pour stimuler un élément de savoir de ces outils.

La priorité pour la continuation de cette oeuvre vient de duex sources. La réponse des participants à ce projet était favorable- Des participants veulent utiliser ces outils. Deuxièment, notre recherche et expérience. aussi que la recherche empirique semblant que c'est l'information en retour et la communication que les participnta apprécient et *est* le plus prévu d'acquiescement à l'avenir.

DISCLAIMER

Rationale for Performance Indicators

Performance indicators are a means by which we define the measures we use to identify what *should* be accomplished and what *has been* accomplished. We could. therefore. use performance indicators to see what a person should be doing *and then* what he or she has done. We can then track these measures across time and determine net improvements. We can broaden our observations to a larger group and make the

same quantitative observations and assessments of an entire group or make distinctions among various numbers of groups.

With the growing recognition that a task is not manageable if it is not measurable. performance indicators have gained a tremendous popularity. In an era of higher expectations and lower expenditures. organizations have had to assure themselves that their people are doing what is expected of them. The gap between expected and actual levels of performance needs to be closed. Assessing what *should* be done and what *has* been done is where performance indicators have found a natural home.

Unfortunately. "performance indicators" has become something of a euphemism. Within Industrial and Organizational Psychology. the behaviourally based requirements for success on the job are supposed to be determined *before* an incumbent is placed in a job or given a responsibility. The rush into performance indicators as a *post hoc* implementation of job analyses. coupled with employees' perception that they are being asked to do more. with less. for less has strained the acceptance if not credibility of performance indicators. To illustrate. discussions about performance indicators usually fall into two (largely negative) categories:

- The first is that performance indicators are not required. take up too much time or effort, or that they would involve "micro-management" of the people in question. We can think of this as the "I Don't Need This" argument.

- The second is that performance indicators are thought of as a insufficient sampling of the larger set of "important" behaviours that comprise successful performance. We can think of this as the "It's Not Enough" argument.

These arguments are likely motivated those who feel they are already too busy or would describe their responsibilities as too large to distill down to set of concrete. observable behaviours. Our recent experience with Supervisors in a large nuclear power development organization showed this to be the case. Over half of the Supervisors failed to see mandated tasks and specific behaviours as a part of their job. These tasks were largely safety related and were conditions of employment. These Supervisors originally voiced great reluctance at the use of performance indicators arguing that there were many other important behaviours they performed on an "as needed" basis. These post hoc behaviours. they felt. were not captured by a core list of behaviours that defined success on the job.

The truism "You can't manage what you don't measure" takes issue with the "I Don't Need This" and "It's Not Enough" arguments. Measuring is a part of having goals. The successful attainment of specific goals requires that:

1. a goal is clearly identified.
2. the path to the acquisition of that goal be clearly (and preferably *behaviourally*) defined,
3. that people value attainment of that goal and lastly.
4. progress towards reaching the goal (feedback) is objectively presented.

In our dealings with organizations the world over. the successfully managed ones understand this the important of measuring for the sake of clarity. The important aspects of goals are in place. And the last predictor of success is that the organizations truly adopt a Kaizen (Continuous Improvement) philosophy. Interestingly. in the utility mentioned above. the initial reluctance gave way to a strong acceptance of performance indicators. as delivered within HCA's Human Performance Management System (HPMS™.) Many participants commented that now they know how to do their jobs. they knew what the specific expectations were. or they knew where to focus their work energies. (In the text that follows. we will use the terms "Performance Indicators" and the acronym HPMS™ interchangeably.)

Rationale for HCA's Human Performance Management Systems (HPMS™)

HCA has combined our knowledge about performance reviews. human assessment. feedback systems. self management and other aspects of people in the workplace to create our Human Performance Management Systems (HPMS™.) In short. we can combine the best of these aspects of work into a coherent system that provides near-immediate non-threatening and non-confrontational feedback. ratings that have rating biases controlled. information that is desirable by participants. and a plan for successful self-management.

In the past. organizations created supervisory levels within organizations to ensure that responsibilities and directives were met. Nearly everyone knows that a tall. thin organizational chart implies many levels of management – often middle managers. In fact. this has been a tradition in most of North America's organizations. A revolution of sorts in the last two decades has been the demolition of this middle level of management in favour of self-directed or self-managed employees and work teams. While this has been the norm in the Far East. it is a revolution fraught with anxiety and quarrelsome relations in North America.

HCA developed its HPMS™ over a span of twelve years. Research. field-testing and collaboration with many leading organizations brought us to the point where we knew we had a viable method for managing human performance. With the advent of the World Wide Web and web-aware tools. HCA could bring the HPMS™ methodology to organizations via the Internet. various Intranets. and consumer-computing devices. Like our RAD CAT™ radiation safety-training program that can be run from computers. digital telephones or Web TV's. HPMS™ affords people the opportunity to get useful performance information from wherever they are.

This performance information is critical. People cannot comply with legislation without information. They cannot prepare for reviews or inspections without information. They cannot meet standards and improve by meeting higher standards without information.

We have invited people to answer the question of "How do you know your people are doing what they are supposed to be doing?" One answer would be to inspect. perhaps frequently. to ensure that people are doing as they should. If they are not. the question becomes one of how best to close the gap between current performance (or compliance) levels and expected levels.

Many organizations. including the AECB. no longer have the inspection resources they may have once had. Other organizations must now reallocate inspection resources to other venues as budgets shrink and dwindle. Others have demonstrable accountability literally forced on them. In all cases. the organization must still show that people are performing to standard. and must find new means of doing so.

Coupled with the "Do more with less" argument implied above comes a demand that is new to many organizations. They must now surpass past performance levels and be as good as the best in the world and no longer simply "good enough" or as good as they've always been.

The implications for the AECB can be seen in the following questions facing the AECB:

- Does the AECB step up the policing of Licensees and Permit Holders?
- How can the AECB best deliver consistent ratings of Licensees and Permit Holders?
- How can the AECB foster better working relationships between Inspectors and Licensees and Permit Holders?
- How can the AECB foster continuous improvement in Licensees and Permit Holders?

Summary of Activities Performed

The scope of our contract was fairly narrow and was achieved in a remarkably short time period. With weekly and fortnightly progress reports. HCA was able to complete the following activities.

1) Development of Job Analysis Information

The term "job analysis" probably betrays the training of the Industrial and Organizational Psychologist. "Job Analysis" is a term used for the methods by which the behaviours linked to success on the job are discovered and expressed in empirical terms. These behaviours required for success on the job are also examined by what some people would refer to as "Needs Analysis."

Regardless of terminology. HCA was adamant that a meaningful discussion about performance indicators could take place until the concrete, observable and measurable behaviours required for success were ascertained.

We attempted to base our job analyses on a set of standard operating procedures for Nuclear Medicine and Industrial Radiography. We found that there were *no available* standard operating procedures for either group of activities.

2) Development of Web Tools as "Proof of Concept"

HCA needed to show that a thorough set of performance indicators tools could be readily developed, and that this set of tools could be immediately distributed to all (or nearly all) participants in the pilot study. By successfully developing and delivering the web tools, we have demonstrated the proof of concept and shown that there is a positive response to both these tools and the proposed final product(s) that will follow from this pilot.

Timeliness was an important aspect of this pilot project. Since HCA already had considerable experience in the area of performance indicators vis a vis our HPMS™ developments. past research and publications, we were able to follow a very constrained schedule.

3) Feasibility of Web-Tools for Performance Indicators

The degree to which the Web tools were thought to be feasible was based on the following:

- Development of Program Specifications for Web-Aware Tools
- HCA's own past research and publications
- HCA's expertise in the area of performance indicators
- HCA's expertise in the development of computer-based training
- HCA's expertise in the development of web-based and computer-based human assessment, performance reviews. and other human resources functions
- HCA's development of a Lab Inspection Checklist. based on Behaviour Observation Scales approach to performance reviews
- Survey Results and Feedback from Participants

The expected usefulness or feasibility of the web tools was. therefore, based on HCA's considerable experience. In fact. our work on web-based and computer-based human resources applications has won us a "Best in Class" award from the Southwestern Ontario Manufacturers' Association as well as being recognized by the McGill Graduate School of Business as one of Canada's premiere virtual organizations.

Without intending for the above to sound immodest, we wished to demonstrate some expertise in this regard. The feasibility of the web-based (or web-aware) tools for performance indicators (as called for in the Recommendations) is almost assured.

There are at least two threats to the success of the implementation of performance indicators in the AECB and the nearly 3,800 Licensees who could be using the system comes from two fronts. They both underscore the importance that the AECB should attach to "getting it right" and being accountable.

The first is that the AECB does not purposefully link success in the performance indicators to some outcome. There is a contingent link between effort, performance and feedback that must be recognized.

- If Licensees work harder (more effort) they should see a direct increase in performance. The performance indicators tools should reflect this increase.
- If there is an increase in measured performance, the Licensees should expect favourable feedback or favourable consequences.
- In our work with the University of Western Ontario, successful Permit Holders were moved down the inspection triage list. They knew that their good performance would result in fewer surprise inspections. They also knew that if their performance level slipped, they would move *up* the inspection triage list. The AECB must have consequences for doing well or poorly on the performance indicators.

"Getting it right" is important. Being held accountable is important. The benefit here is that people prefer getting a clear set of expectations and a clear route for achieving those goals.

The second threat will come from the Licensees. If they view performance indicators as a passing fad, or a procedure that will *not* be rolled out to all Licensees, they will choose to not participate. This is exceptionally important. HCA has seen other organizations attempt to introduce performance indicators or related programs and we have watched these companies fail. With our clients, however, there have been successful introductions. The reason for this success has been that we've helped to make people aware of their own job responsibilities. The performance indicators were introduced as a means of bringing additional clarity to their job expectations. We have had a number of employees in client organizations say "Now I know what is expected of me in my job." While neither HCA nor the AECB are "telling people their jobs" we *are* helping them with a considerable *portion* of their jobs.

4) The User Survey

HCA conducted a survey of the twelve top-rated Industrial Radiography and Nuclear Medicine Licensees for a total sample of 24 Licensees. We then created a static, paper-based copy of the preliminary copy of the web-based performance indicators ratings tools. Each Licensee was faxed a cover letter, the paper copy of the web-based performance indicators ratings tools, and a survey. Appendix A contains a copy of the Pilot Project Survey. Appendix B contains a sample reply letter. All Licensees who submitted a reply received a reply.

In order to be mindful and respectful of the Licensees' time. HCA kept this survey brief. Our goals were to:

- Determine who had (or will have) access to the Internet
- Determine what proportion of Licensees would like to use a Performance Indicator tool like this, and to
- See who would want to keep informed about the progress of this project, or see how their own ratings might appear to them on the web page

Of the 24 Licensees. 12 replied within the two-week period allotted by HCA for receiving responses. After that point. HCA telephoned. e-mailed or faxed the Licensees with outstanding surveys. HCA was also contacted by telephone by two Licensees who apologized for not returning their surveys promptly. HCA presented the same survey to others. similar to the sample of Licensees.

We do not report the late data. telephoned data or the data from similar respondents not in the AECB-derived sample. We will comment, however, that the responses were extremely favourable.

The breakdown of each question and the final comments are provided below. The dark shaded area for each pie chart shows the percentage of respondents who agreed with the statements or said "Yes." The blank area within each pie chart represents an answer of "No," disagreement or a response that was left blank.

What will be apparent is that there was near uniformity in the responses. One respondent stood out as being somewhat antagonistic response – largely attributable to the (mistaken) belief that:

- the private ratings would somehow be publicly available. and
- that the person in question was adamant about his desire to *not* have Internet access in the foreseeable future.

Nevertheless. this respondent still wished to be kept informed of the project as well as wished to see how his site's ratings would appear on the web presentation.

Another respondent in the AECB sample responded that he "very much" wanted to practice working through his site ratings with an AECB Inspector.

It would appear. therefore. that even though there was one markedly negative response, the overall response was very favourable to the web-based performance indicators. HCA knows from previous experience in the development of Web-based and computer-based training and human performance management systems in general. that the response to such an endeavor will be favourable.
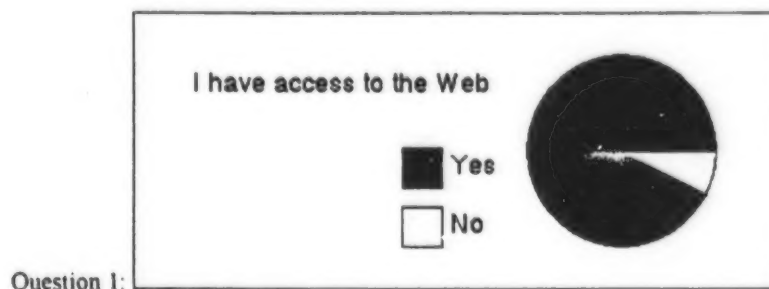
Question 1:

Ninety-two percent of respondents indicated that they have access to the Web.

I have will have access to
the Web in 1998

■ Yes

☐ No
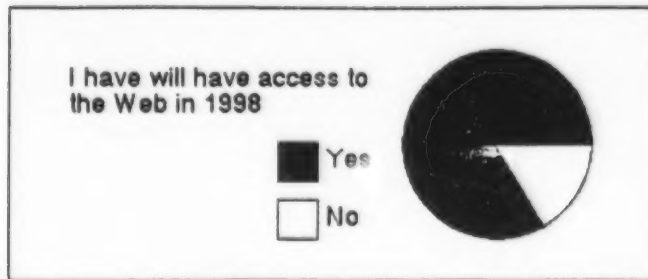
Question 2:

Eighty-three percent of respondents reported that they would have access to web pages in 1998. HCA is unsure whether or not this means that *fewer* people will have web access or simply that the respondents' organizations have policies in flux about Internet or Intranet access.

I have Internet E-Mail

■ Yes

☐ No
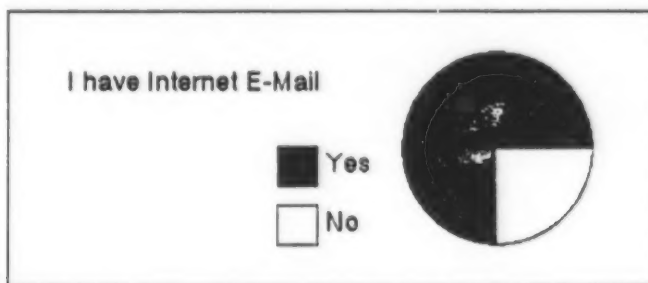
Question 3:

Seventy-five percent of respondents said they had Internet e-mail. Since the AECB had earlier reported that the many of the Licensees did *not* have Internet e-mail, the respondents may have acquired Internet e-mail accounts recently, or have acquired personal accounts at work or home.

I like the format
of the Web
ratings page

■ Yes

☐ No or
blank
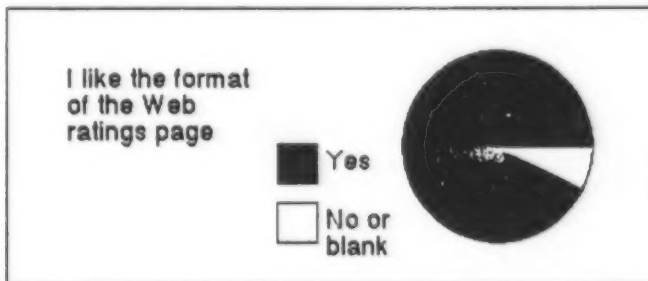
Question 4:

Ninety-two percent of respondents said they like the format of the Web page ratings form. While we did not discern whether or not they based this view on the paper copy or from visiting the web page site proper, it is likely that they viewed the paper copy alone. If this was the case, this is stronger support for favourable ratings.

I like the idea
of seeing my
AECB ratings
on the Web
page

■ Yes

□ No or blank
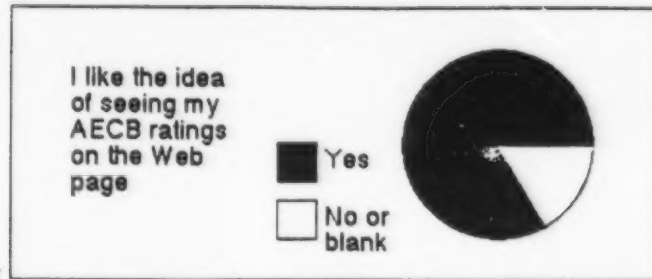
Question 5:

Eighty-three percent of respondents reported that they would like to see their AECB ratings posted on the web page. While most understood that these ratings would be private, confidential, and password protected, a few respondents added margin comments on the survey. They said that "depending on access and privacy" they would want this feature. In some cases, HCA wrote back to the respondents to assure them that the ratings pages and related feedback would be private, confidential, and password protected. In the description of the performance indicators (program specifications) that HCA will be forwarding to the AECB development team we have made clear that there will be several levels of access.

I like the practice
of preparing for
an AECB
inspection by
using the
information from
the Web page.

■ Yes

□ No or blank

Question 6:

Eighty-three percent of respondents reported that they like the idea of preparing for an AECB inspection by using the information from the web page. This is consis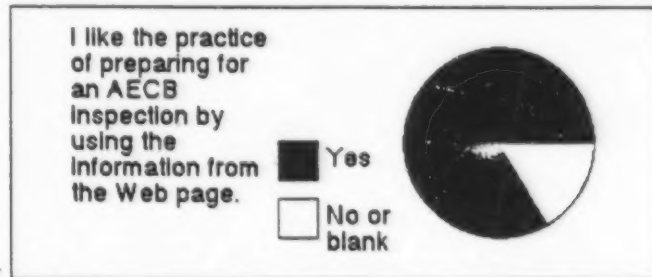tent with our own previous results and research. People will have the most confidence about ratings when the evaluative criteria have been clearly communicated. The MRD's own Pilot Test of a Survey of Licensees reported that having consistency between and among Inspectors and across visits was highly desirable. One argument would suggest that the AECB Inspectors have room for improvement in this regard. If this is the case, the performance indicators will help. If this is *more* a matter of managing Licensees' perceptions, and thereby improving compliance, the performance indicators will still help.

I like the practice
of only allowing
me to see the
AECB ratings for
my site.

■ Yes

□ No or blank
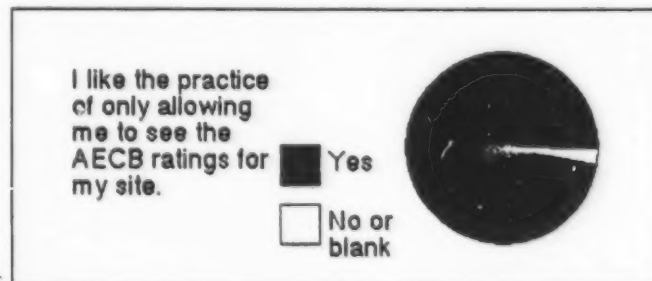
Question 7:

All respondents reported that they like the practice of allowing them to see their AECB ratings. This is expected, as the evaluative information is legitimately private and confidential. The respondents should not ask for anything less.
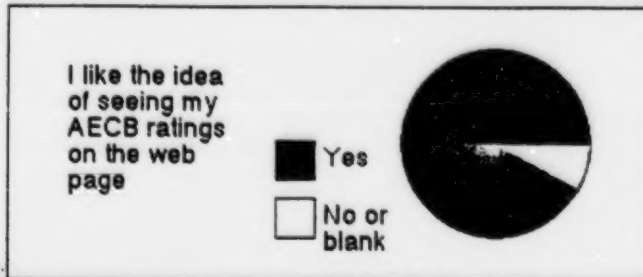
Question 8:

Ninety-two percent of respondents reported that they like the idea of seeing their AECB ratings on the web page. This is taken as evidence that the respondents appreciate the web-based performance indicator tools.
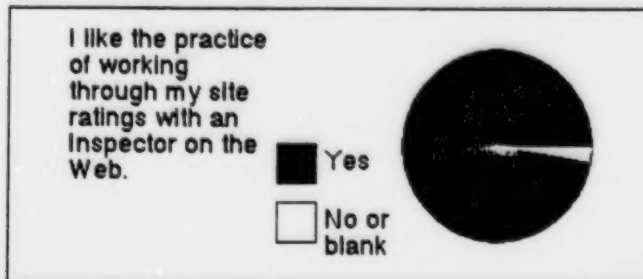
Question 9:

Effectively all respondents reported that they would like the practice of working through their site ratings with an AECB Inspector. At issue here is (likely) the accessibility to, and demonstrable consistency of, the evaluative criteria employed by the Inspectors.
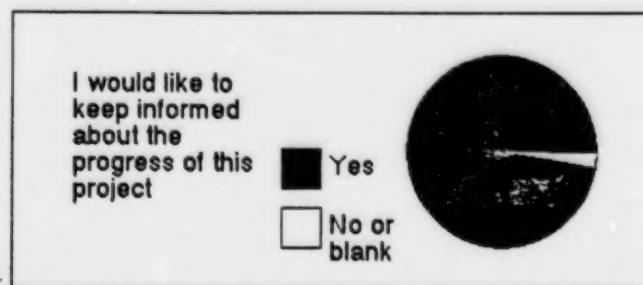
Question 10:

As the first of two "I want to keep informed" questions, all respondents said that they want to follow, or be kept informed about, the progress of the web-based (or web-aware) performance indicators project.

Question 11:

All respondents wanted to see an example of how their AECB ratings might appear. HCA will undertake a follow-up survey that will present a number of display formats and recommend to the AECB the format selected by the respondents.

Recommendations

HCA is pleased to submit the following recommendations:

1. HCA recommends that the AECB view this project as a successful demonstration of the HPMS™ technology to ensure future compliance to, and progress towards higher levels of compliance with, the AECB regulations regarding work with radioisotopes.

2. HCA recommends that the AECB begin construction of a thin-client, client-host tool for the deployment of a larger set of Performance Indicators based on HCA's HPMS™ system for use with Licensees and Permit Holders across Canada. This work should begin the development of thin-client, client-host tools for Nuclear Medicine and Industrial Radiography, as per HCA's attached Program Specifications. . HCA will be pleased to assist the AECB in the development of these tools.

3. HCA recommends the continuation of the development of content for Nuclear Medicine and Industrial Radiography evaluations, and that these evaluations include specific information on recommended compliance behaviours, hazard and risk information, and other information so that the HPMS™ offering is as complete and authoritative a source of information as possible.

4. HCA recommends that the next stages of rollout for this system should include other Licensees and Permit Holders over and above Nuclear Medicine and Industrial Radiography and eventually encompass all Licensees and Permit Holders with whom the AECB has dealings. HCA will be pleased to assist the AECB in the development of these tools.

5. HCA recommends that development of core job analysis information for all Licensees and Permit Holders with whom the AECB has dealings. Moreover, that the development of content (as derived from the job analyses) proceeds in a manner similar to that of the work conducted and proposed for the Nuclear Medicine and Industrial Radiography groups. This job analysis task should begin with the following groups:

    *   Radiation Safety Officers (RSO's)
    *   Nuclear Power Plant Supervisors and Employees
    *   Yellow Badge Certification and Re-Certification Participants

6. HCA strongly recommends that the Performance Indicators approach be fully extended to include policy consideration for successful and unsuccessful performance levels. We have seen the development of lassitude and complacency develop in those for whom poor performance does not equate with suspension of work. Some, but not all, RSO's cannot perform the basic tasks of their job.

Some. but not all. people who were supposed to be trained in radiation safety have dangerous accidents. All people. not just "some." have to "get it right" and then be accountable..Allowing standards or individual performance to slide while attempting to bring in Performance Indicators will signal the failure of Performance Indicators.

7. HCA recommends that the AECB should establish solid "get it right" training criteria. from basic radiation safety through the coloured badge training. The approach to training contained with the AECB Regulations deems that people shall be trained. but lacks guidelines for specifying successful training. Computer-Based Training (CBT) offers a means of delivering consistent training, and can advance the trainee upon successful completion of each section so that only by "getting it right" can the trainee pass. We have amply demonstrated this approach with our computer-based WHMIS training (the first in Canada) and our Radiation Safety Training program called RAD CAT™. HCA will be pleased to assist the AECB in the development of these tools and will offer to assist further by making RAD CAT™ available at no cost.

Summary

HCA has shown in a brief twelve weeks that it is possible to:

*   Develop a comprehensive set of performance indicators for two groups of radioisotope users within the aegis of the AECB.

*   Create a working preview in a set of linked web pages to show how these performance indicators and their supplementary components can be delivered.

*   Gather positive feedback to assure the AECB that this approach *is* well received and that it *will* lead to successful self-management and future compliance by Licensees, Permit Holders and others accountable to the AECB.

In short. HCA has shown that the use of performance indicators. coupled with web-based or web-aware information tools will be a success.

HCA looks forward to continuing to work with the AECB.

Together. we can usher in a new era of continuous improvement with the AECB.

Question and Answer Period

In our presentations to the Canadian Radiation Protection Association (CRPA), the International Atomic Energy Association (IAEA), the Institute of Nuclear Power Operators (INPO), Ontario Hydro Nuclear (OHN), Ontario Hydro Technologies (OHT), World Association of Nuclear Operators (WANO) as well as to our own client base, HCA has fielded a number of questions about HPMS™. They have focused on, but not been limited to, the following topics:

- The long term viability of behaviour-based performance indicators
- The place that behaviour-based performance indicators have in the start and maintenance of self-directed improvements in compliance

Question: Why is behaviourally-based feedback "better?"
Answer: It's motivating, unambiguous, and measurable. Long-term studies have shown that this feedback is not only easy to give, but its increase on motivational levels *lasts*.

Question: Why measure so much? Won't it make the raters' job harder?
Answer: You can't manage what you don't measure. In fact, it makes the job of being a rater a lot easier. You can now rate the job performance (i.e., specific behaviours) instead of getting ratings based on biases, social preferences, grade curves, and the like.

Question: We use a written performance agreement. We all write it and we all agree. Why do I need this?
Answer: People want results based on measurable things, not vague statements or intentions. They want to the know that the rules are fair and that they won't change. You can set new performance goals, but that's not changing the rules. Besides , the most frequently litigated "performance agreements" are the broad narrative forms.

Question: Our people don't like numerical ratings. What about it?
Answer: Typically, there are two gripes at play. Either, they don't like *ambiguous* numerical ratings, or they don't like the idea that achieving targets means nothing. We avoid that in the Human Performance Management System (HPMS™).

We look forward to addressing your additional questions in this section.

Appendix A: Pilot Project Survey

This Appendix contains a copy of the Pilot Project Survey.

HCA

ASSESSMENT
EXPERTS

698 Valetta Street, London ON N6H 2Y6 Canada
voice 519-472-4971 fax 519-472-3660
e-mail drtdhill@gtn.net web http://www.gtn.net/users/drtdhill

160 Jalan Desa Makmur, Taman Desa, 15800
Kuala Lumpur, Malaysia

Re: A request for your feedback about an AECB Rating Form in Development

Dear A Kausch:

HCA—Assessment Experts and the Atomic Energy Control Board of Canada are working together on a pilot project called "Performance Indicators for Radioisotope Licensing Activities." As President of HCA, I offer my enthusiasm for this project and its two opportunities. Not only do we have the honour of working with some of the most interesting people in Canada, but we also have the opportunity to bring a new level of clarity and ease of use to the AECB's compliance tools and licensing activities.
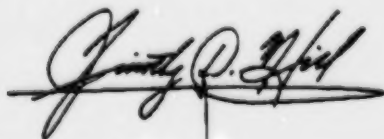
With this in mind HCA—Assessment Experts are asking for a few moments of your time. We would greatly appreciate your feedback on our draft rating form available on the Internet at www.gtn.net/users/drtdhill/aecb. AECB Inspectors, to rate Nuclear Medicine and Industrial Radiography licensees will use the final version of this form.

Your feedback and opinions are *very* important to us. Your contribution will help us to develop a set of rating tools that are reliable, valid, and based on your specific work environments. By making our rating forms available and expectations clear, we hope to remove rating ambiguity, biases, and inconsistencies. You and your facility will, in turn, have a well-defined standard against which your performance will be measured. In other words, there will be "no surprises".

I have enclosed a copy of my draft rating form for the convenience of those of you who do not yet have access to the Internet. Please e-mail me with your suggestions at drtdhill@gtn.net. You may also fax me at (519) 472-3660 or contact me in person at (519) 472-4971. Our project liaison with the AECB is Mr. Bill May in Mississauga and Mr. Jongile Majola in Ottawa.

Both the AECB and I extend our thanks to you in this matter, and I personally am looking forward to hearing back from you.

Yours truly,

Timothy D. Hill, Ph.D.
President, HCA—Assessment Experts, Canada/Malaysia
President, HCA/CourseWare, Canada/Malaysia

HCA/AECB Feedback Form:
Please complete and fax back to 519-472-3660

A. Kausch, Unique Detection Services

My e-mail and I...

I have access to the Web..	Yes	No
I will have access to the Web pages in 1998	Yes	No
I have internet e-mail...	Yes	No

My e-mail address is: _____

My e-mail software is: _____

My web browser software is: _____

I like the...

Format of the Web ratings page...	Yes	No
Idea of seeing my AECB ratings on the web page..	Yes	No
Idea of preparing for an AECB inspection by using the information		
from the web page..	Yes	No
Practice of only allowing me to see the AECB ratings for my site...........................	Yes	No
Idea of seeing my AECB ratings on the web page..	Yes	No
Practice of working through my site ratings with an Inspector on the web.................	Yes	No

I would like to...

Keep informed about the progress of this project	Yes	No
See an example of how my AECB ratings might appear on the web page	Yes	No

Is there anything else?
Please feel free to use the area below to offer any ideas, opinions, or suggestions you might have.
HCA—Assessment Experts was contracted to conduct this pilot (contract number: 97-211.) At this
point, we are using the web pages as "proof-of-concept" for web-aware performance indicator tools.
The samples for this study include Nuclear Medicine and Industrial Radiography. These tools have
been designed with several aims in mind:
- To help Inspectors make reliable ratings and eliminate inter-rater idiosyncrasies
- To help Licensees and permit holders attain higher ratings
- To provide Licensees and permit holders with a clearer and less ambiguous set of performance
  expectations
- To increase the ease with which Inspectors. Licensees and permit holders can use, access and
  understand AECB ratings.

We look forward to your feedback.

Appendix B: Sample Response Letter to Pilot Project Survey Respondents

This Appendix contains a copy of a sample response letter to pilot project survey respondents

HCA

ASSESSMENT
EXPERTS

698 Valetta Street, London ON N6H 2Y6 Canada
voice 519-472-4971 fax 519-472-3660
e-mail drtdhill@gtn.net web http://www.gtn.net/users/drtdhill

160 Jalan Desa Makmur, Taman Desa, 15800
Kuala Lumpur, Malaysia

TO: Mr. Len LaFond, The Graff Company
From: Dr. Timothy D. Hill, HCA—Assessment Experts

Thanks for your response to our brief fax survey. I know that every survey *I've* ever done comes complete with a lackluster thank-you note, but we *really do* appreciate your feedback. Our contract with the AECB is to provide them with information about making clearer ratings. This work is progressing along two fronts: With Licensees and Permit Holders, as well as with AECB Inspectors.

People can be ambiguous when making ratings, so we are striving to reduce that ambiguity. Licensees and Permit Holders have said that want *reliable* ratings, earlier. We will be recommendations about these tools. The AECB has said their intention is *NOT* to micro-manage Licensees and Permit Holders, but to help foster compliance with AECB regulations.
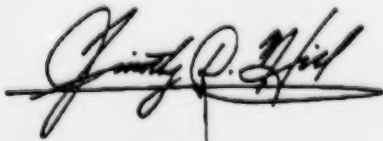
We have started from these needs with the belief AECB Inspectors, like most raters, try to make good, clear ratings and Licensees and Permit Holders are similarly well intentioned. However, the Inspectors, like all people, are prone to biases. Rules, however thoughtful, often leave room for idiosyncratic judgement and a lack of consistency.

With the hype and emphasis that people place on the Web, e-mail and the internet in general, it is often difficult to separate those things that work well from those that simply have a high-tech or "gee-whiz" nature. Our use of the Web as a demonstration was made for several reasons:
- It provides a quick means of showing many people the preview
- It gives us the chance to dynamically link other information (suggestions for compliance, immediate feedback, hints from Inspectors, etc.) that cannot be readily presented in a paper-based presentation (or on the earlier fax!)
- It establishes the "proof of concept" for the suggestions we will make to the AECB. This proof of concept, together with your feedback will ensure that the AECB gets a viable tool, on time and under budget.

To close, I'd like to say "Thanks" again, and to invite you to offer your views about what you'd like to see done better or differently on your next AECB inspection. (By the way, sorry about "Lafond" and not "LaFond" earlier. The "Lafond" spelling was what we received from the AECB Inspectors!)

Yours truly,

Timothy D. Hill, Ph.D.
President, HCA—Assessment Experts • HCA/CourseWare, Canada/Malaysia

Appendix C: Considerations for a Thin-Client, Client-Host Based Delivery System

This Appendix contains a brief description of the features of web-based versus client-host based delivery systems for performance indicators and on-line database management.

Many people use the Web on a daily basis. Bank transactions from home, reviewing movie listings, or helping children with homework are all becoming popular web-based activities. In fact, there are now more children than corporations with their own Web pages. With this surge in popularity comes a new responsibility – that of providing secure content in a timely manner.

The delivery of packets of information from a source to a destination is accomplished in the Internet (and its graphical representation, the Web) by a number of means. TCP/IP (Transmission Control Protocol/Internet Protocol) is actually a suite of transmission protocols, of which HTTP (HyperText Transport Protocol) is one. We are most likely to me familiar with HTTP, not because we know the acronym, but because we type those letters when we type a web page address. For example, my personal web page address is http://www.gtn.net/users/drtdhill, (or http://www.HCAAssessmentExperts.com.) The "http" in these addresses indicates that the hypertext transport protocol and means of descri... page are the rules that will be used to display the end user's images he or she sees on the screen.

In short, HTTP allows the user to receive HTTP "pages" from the source computer and then display them on the destination computer. Each page is downloaded, assembled and then viewed on the computer screen. Most software that lets a user view a Web page ("browsers") will create a special temporary directory in which these page files are stored. These stored files are available to the end user, and can be manipulated, deleted, or changed in other ways.

In addition to the ability to modify important documents, HTTP requires that the user actively search for new information. Recent developments of "push" technology and active channels can require considerable additional investment in hardware and software.

As organizations recognize a greater need to integrate computers into networks that span a building, town, country, or even the globe, the use of HTTP Web, Internet and Intranets seems to be an immediate choice of convenience.

Other choices exist – the world of Java is generating a great deal of attention and the Client-Host model is actually delivering on that attention.

Java promises to bring together active delivery of HTML content complete with applets and features such as animation, sounds, and multimedia. A touted strength is Java's intended platform independence. Since the *entire* application must be downloaded to the user's computer, Java can take a *long* time. While there is little question about the bright future for Java and related programs, controversy about standards and the demand for upgrades to *very fast computers* place the move Java a little back.

Combining the ease of access of the Web, Internet and Intranet *with available resources* is the Client-Host model. If HTTP gives us Web-based pages and information delivery, the Client-Host model can be said to give us "Web-Aware" information delivery. The "Client" is the User or the User's computer. The "Host" is the machine the client is in communications with. The term "Thin Client" is typically used to refer Users who do not need to log on to the Host computer (be on-line) at all times. As well, Thin Client will mean that there is low overhead in terms of maintaining, updating and communicating with the Client from the Host.

The user has a program that resides on his or her computer. The database and other tools reside on the host computer. When the user contacts the host computer, the host will update *only those parts of the user's information that need updating*. The user runs the program (with the new information) locally, without having to be connected to the host.

Before providing recommendations for the software development and support tools, there is another consideration that should be brought forward.

The "Users" of such a system are different from most applications in that they are more diverse. The "top level" user, the AECB Inspector will have greater privileges than the RSO (or the person who performs the RSO's functions.) Below the RSO level would be the Licensees, Permit Holders, and related others, including lab staff, hospital employees and the Industrial Radiographers in the field. We can see, therefore, that will be at least four levels of "User" and that these levels should have open communications between them.

Having made a brief note about the types of users, HCA believes that the AECB should adopt a client-host based delivery systems for performance indicators and on-line database management. We would recommend the following:

- Marimba Castanet™ tools, including:
  - The Castanet Transmitter: network server software that manages the distribution and maintenance of Castanet applications.
  - The Castanet Update ow™ SDK, software development kit. Note: Acquisition of the UpdateNow™ SDK precludes the T er and Channel applications.
- The Pervasive.SQL server de database software provides the greatest breadth of database functionality.
- Windows NT™ based server computer station
- The most difficult recommendation is for the development environment of the end user application. A number of Rapid Application Development (RAD) tools exist, with some having the benefit of wider audiences than others. Visual Basic, for example, would seem to a logical choice with its links to the Microsoft environment, ability to run on a range of Windows platforms, to name a few. Another suggestion is Clarion from TopSpeed Corporation. Clarion lacks the benefit of popularity that Microsoft affiliation brings, but has strengths in development time, cross-platform abilities, and a wider range of Java and Internet support for future development concerns. The Clarion Internet Developer's Kit can add even greater Internet functionality. By a (very) narrow margin, HCA would recommend Visual Basic.

In short, the rapid development of the client-side application that is web-aware and can contact the host/server to access a web-based database is the proposed task. The client-side application needs to be developed so that it can access local data (in the absence of an internet connection,) work viably off-line as well as on-line, and whenever possible, foster continuous improvement in compliance.

Appendix D: Logic Flow for Performance Indicators

1. Determine actual behaviours required for success in task or job at hand.
   1.1. Using a job analysis, create a list of unambiguous behaviourally-based descriptions of job behaviours
   1.2. Have a panel of subject matter experts verify that the behaviours are valid predictors of success in task or job at hand
   1.3. Create a set of hints or context-relevant information for each behaviour
   1.4. Communicate the behaviours required for success on the job.

2. Determine current levels of performance in task or job at hand.

3. Demonstrate the gap, if any, between the expected and actual performance levels.
   3.1. Many organizations waste tremendous amounts of time and energy trying to determine appropriate new targets for performance. If there is a wide gap, leave the participants with the aim of rapidly closing the performance gap. Leave them with the tools to measure their progress – independent of outside review. If there is a small gap, set the improvement at a difficult but achievable level.
      3.1.1. If there is a wide gap between expected and actual performance levels, determine the new target to be one standard deviation above the extant performance level. Aim for a one sigma improvement within 3 months. Allow participants to measure this for themselves.
      3.1.2. If there is a narrow gap between expected and actual performance levels, determine the new target to be ten percent better than the extant performance level. Aim for this improvement by the next assessment cycle.

4. Provide tools for participants to see their individual performance levels *prior to* review or inspection. Communicate the means by which participants can improve their behaviour *prior to* review or inspection, and how they may see the measurable differences.

Appendix E: Connection Between Users and AECB

There are two scenarios in the current proposal. The first entails a user (Licensees, Permit Holders, RSO's and others, as well as the Inspectors who might be on-site and using the end users' equipment) working off-line to review information, enter information, etc. They have complete functionality, but are not connected via the Internet to the Server. They may not, therefore, have the information that is the most up-to-date *at that moment*.

Example A: Working Off-Line

Client/User Side   **Host/Server Side**

Person uses information that is already available on the computer at hand. The user can review progress, determine goals, etc. off-line

The second describes the case wherein the user has started the application and has agreed to connect via the Internet to the Server. Upon connection and verification, the Server automatically updates the user's files (by recognizing the machine ID and user ID.) The user may now work on-line or disconnect and work off-line to review information, enter information, etc. They also have complete functionality, may not be still connected via the Internet to the Server. They do, however, have the information that is the most up-to-date *at that moment*.

Example B: Working On-Line

Client/User Side   **Host/Server Side**

Person starts the application running locally on their computer. They confirm that they wish to sign on and get an automatic update.

Windows NT Server is connected. Marimba Transmitter sends updates (those parts that are new since the person last logged on.) Pervasive SQL database manages database and queries from users.

Person is automatically asked if they wish to sign off after confirmation of receipt of new information and can now work off-line. If they work on-line, they are directly connected to the on-line database on the server.

The logic flow for both scenarios is as follows:

1. The user starts the local copy of the HPMS™ program.
   1.1. The user will sign in and pass the security protocols.
   1.2. This will identify the local computer, site, user and whether or not the use is a guest (e.g., other staff, a visiting Inspector, etc.) or the person responsible for radioisotope use at the site.

1.3. Levels of access are determined. For example. an Inspector can change a ratings record. but no one else would be able to. while a lab employee can change their own personal information (phone number. address. etc.) but not other information.

2. The user decides whether or not he or she will be working off-line *or* on-line.

3. If the user decides to work off-line. he or she will have the information that was current when they last received an update. Users with *no Internet connection* can receive a diskette.

4. If the user decides to work on-line.
    4.1.1. The local computer will automatically establish an internet connection to the server. The user will not have to take any action on this step.
    4.1.2. The local computer will be automatically updated with any changes that have occurred since the last logon. The Marimba Castanet Transmitter will effect this delivery. The user will not have to take any action on this step.
    4.1.3. The user's security protocol information will determine which level of access and functionality they will be permitted during the on-line session.
    4.1.4. The user (according to their permission level) can review information in the Pervasive.SQL database. make queries. add or change information. etc.
    4.1.5. The log of on-line activity will be updated when the user signs off. The user's logging off will initiate a final update. so as to include any additions or changes effected during the on-line session.

5. Once logged off. the user will have the most complete information *at that point* and be able to access that information while working off-line.

A more detailed program specification is included as an Appendix to this proposal.

Appendix F: Clarion Technical Information

The Clarion development environment brings a number of unique assets. HCA has provided text from Clarion to describe some of these features. Our comments are provided in the bracketed text in italics (*like this example.*)

<u>Note</u>: The comments that appear in the following section are the provider's claims for the product.

Clarion Internet Connect: Internet Connect Web-enables your Clarion applications in minutes. It is an economical way -- both from a monetary and a network traffic viewpoint -- to give your end users full-featured applications over the Internet/Intranet. With Internet Connect, you retain more control over the program flow and database access than with any other Internet/Intranet solution. Your applications can be run on any platform that supports a Java-enabled browser. (*This would not include older browsers for the time being.*)

Internet Connect solves three pressing needs:

- Universal access to complete database applications – create server-based. full-featured applications that execute over the Web. Other tools. including Java-based tools, can provide full applications when executed locally. but not when launched from within a browser.
- Economical network traffic supports a universal thin client – the middle layer requires Windows NT or Windows 95 -- the application will run within any Java-enabled browser. therefore allowing end-users on Unix. Macintosh. OS/2 and Windows to access the application. Internet Connect requires only the data the end-user works with. and the formatting options for its appearance, to be downloaded over the Internet/Intranet. Current solutions often involve huge runtimes – that must be downloaded. installed and stored on the client. (*HCA agrees. The large runtimes are a problem with most other options.*)
- Save development time and money -- Web-enable existing Clarion applications in just one step -- using the same source. (*This is irrelevant if you are not already using other Clarion applicatons.*)

Internet Connect, used in conjunction with Clarion Professional Edition. consists of two products -- the Clarion Internet Developer's Kit and the Clarion Application Broker . The Internet Developer's Kit is a set of templates and Java classes which allow the developer to Web-enable new and existing applications into Internet database applications (includes a limited edition of the Application Broker). The Application Broker is a specialized Web server designed to run your Clarion applications. It can run alone or with any other Web server

Clarion Internet Developer's Kit

The Internet Developer's Kit is an add-on product that can be used with Clarion Professional. or Enterprise Edition to develop hybrid Web/Windows applications or to Web-enable existing Clarion applications. Web-enabling Clarion applications is a one-step. template driven. process. A single-connect version of the Application Broker is included with the Internet Developer's Kit.

Fastest, easiest way to make interactive, data-driven applications for the Web: From an existing database, the Clarion application wizard can create a complete application for navigating. editing. and reporting the database in less than five minutes. Now the same wizard can create a Web application. Internet Connect provides *full support for novice and experienced Web application developers.* Using the Clarion application wizard and the Internet Connect global extension template. novice programmers can develop Web applications without writing a line of code. For experienced programmers. the template provides the ability to embed .HTML tags. Java script and text. You also have the ability to set conditions or use runtime variables within your .HTML text or Java script.

Creates hybrid Web/Windows applications: The application you develop will run locally under Windows or in a Java-enabled browser -- using the same executable and source code. There is no need to compile multiple versions. And there are no coding changes required!.

Database connectivity: Powerful. direct and easy access to SQL and PC databases.

Clarion Application Broker

The Application Broker launches hybrid Web/Windows applications on the server and refreshes the Clarion Java Support Library on the browser. The Application Broker then organizes the message traffic into a remote computing session. It routes events produced by the Java Support Library to the application and routes HTML scripts produced by the application to the browser. The Application Broker must be installed on every Internet server that launches Clarion hybrid Web/Windows applications.

Brewing Java: Utilizing open standards. the Application Broker sends the application content. and the classes necessary to view it. to the client – simultaneously. This compact set of Java classes is used to create List Boxes. Entry Fields. Data Forms. Buttons. Check Boxes. etc. All the client needs is a one-time

download of the Java package -- requires only 200KB (before compression) -- making Internet Connect *the perfect solution for ultra-thin Internet/Intranet clients.*

Scalability: The Clarion Session Manager routes requests across multiple machines in an enterprise server farm providing load balancing for high traffic implementations. The Session Manager is available separately.

Economical application deployment: Internet Connect applications maintain a traditional Client/Server "connected" state to the user. The Application Broker creates a persistent connection on behalf of each user. and if you use a SQL back-end it attaches only once at the start of the user's session. Executable code is loaded only once. no matter how many concurrent users are logged in. Each new user requires only 100s of KB of RAM to run your applications. not megabytes -- providing excellent end-user performance. optimal resource utilization on the Web server and a significant reduction of overhead.

Robust, secure data management: The Application Broker provides fast. efficient handling of simultaneous browser connections. It works within firewall security, allowing your applications to run from behind a firewall or proxy server -- without compromising your security.

The Registry was developed with Clarion Internet Connect. a wonderful new tool that:
- is *3 to 5 times more productive* than Visual Basic. Delphi. or PowerBuilder
- creates applications for Windows 3.x. 95, and NT *from the same source*
- generates Web-enabled 3-tier database applications *in a single step*
- animates the user interface with an *ultra-thin reusable Java client*
- produces the *kewlest interactive database pages* on the Web

Appendix G: Marimba Castanet Technical Information

The Marimba tool set also brings a number of unique assets. HCA has provided text from Marimba to describe some of these features. Our comments are provided in the bracketed text in italics (*like this example.*)

<u>Note</u>: The comments that appear in the following section are the provider's claims for the product.

(From a research document describing the distribution of software tools...)

By the year 1999. according to Forrester Research. 50% of all commercial applications developed by independent software vendors (ISVs) will be distributed electronically. Why? Because electronic software distribution (ESD). in combination with the Internet. promises to alleviate some of the intense pressures ISVs face today. In the fiercely competitive application market. ISVs need to bring products to market quickly. continually improve customer satisfaction. and keep sales and marketing costs to a minimum. To grow market share and revenues. ISVs are looking for affordable ways to compete by expanding their distribution channels. Today's options include hiring an expensive direct sales force. running expensive catalog ads and direct-marketing promotions. or paying premiums for prime shelf-space at retail outlets. And once the software is distributed. ISVs are looking for ways to provide continuous fixes and enhancements soon after general availability in response to competitive and customer pressures. The software update cycle therefore continues to shorten. resulting in potentially major distribution expenses every several months.

To more cost-effectively distribute products and services. ISVs are turning to ESD and the Internet as a supplement to traditional distribution channels. But until now. using the Internet for software distribution has fallen far short in a variety of ways. Conventional "push" technologies were created to deliver content and advertising to users. but they lack the robustness. security and administrative-control features needed for application deployment. Web-based downloads are complicated and require the user to initiate the process. And Java applets are limited in functionality and require the user to be always connected. Only one software distribution and management system offers all the opportunities of Internet-based deployment. with all of the benefits of the Castanet™ solution from Marimba™.

Castanet enables self-managing, self-updating applications
The Castanet system is a proven solution that helps developers to quickly and easily extend the reach and capabilities of existing or planned applications. It effectively exploits the potential of the Internet as a platform for distributing. managing and updating software.

The Castanet product line supports every step of the application life cycle. Using Castanet. developers can create. distribute. and install an application: maintain and update that application: capture subscriber feedback: and provide personalization on a subscriber-by-subscriber basis. And the entire process is virtually transparent to the end-user.

The Castanet solution is a standards-compliant development platform with a published. open API. Developing to the Castanet API lets developers take advantage of its advanced software management features. such as cross-platform compatibility. enhanced security. guaranteed-complete updates. and administrative control features that are unprecedented in the Internet environment.

A sophisticated and easy-to-use development platform. Castanet scales effortlessly to millions of users, can be deployed easily in days or even hours. and conserves bandwidth with leading application update features that allow for byte-level differencing and compression. In other words. it allows ISVs to send end-customers only what's changed since the last update -- be that a single new feature or software patch. even down to the byte level. This is in stark contrast to other software distribution alternatives that require users to download entire files. or worse yet. entire applications. *(The ability to send "only what's changed" is an exceptional feature. and places Marimba above some of the Clarion tools.)*

It supports applications written in all the popular programming language. including C. C++. Visual Basic and more. And this flexible solution works across platforms as varied as computers. routers. printers, PDAs. cell phones. pagers and network computers.

Why Castanet?

Castanet Lowers Costs and Reduces Time to Market

Supplementing traditional distribution channels. Castanet dramatically reduces the cost of distributing and upgrading applications. Castanet realizes the full potential of ESD and accommodates a more rapid development cycle since product changes. such as minor updates and new features, can be distributed to consumers over the Internet as they happen. Its dynamically linked libraries (DLL) are very small, only 60 Kbytes, making it easy to integrate into existing or new applications for point-of-use upgrades. *(In other words, older WIN3.x machines that are likely already at their limits, are not likely to be unduly burdened.)*

Castanet Increases Brand Loyalty and Customer Retention
The Castanet solution helps software vendors increase preference for its solutions by dramatically improving service (i.e., automatically sending software patches to customers over the Internet), and providing highly personalized products. Castanet also enables developers to gather detailed feedback about how subscribers use and react to their offerings. The continuous connection to customers provided by Castanet enables developers to continually fine-tune and enhance service and better retain customers. *(While this sounds like a "feature" aimed solely at software development houses, it would be an excellent means of tracking use, if not satisfaction.)*

Castanet delivers state-of-the-art security and control
With Castanet. developers can confidently deliver applications and services over the Internet to customers. Castanet offers the most sophisticated, advanced security features available from any vendor for controlling software distribution over the Internet. Security options include Transmitter server authentication, secure communication using SSL encryption, and code signing. And Castanet supports an unprecedented level of control for the Internet, with easy-to-use access control tools. *(Again, since information is securely sent, the ratings, Inspectors' feedback, etc. are also protected.)*

Castanet Facilitates Iterative Development and Guarantees Up-to-Date Software
Since updating end-users is as easy as publishing the update to a single server. developers no longer have to wait for a major upgrade to introduce incremental improvements or minor bug fixes. they can be distributed as they become available. And because of the byte-level differential update feature. only the code or information that's been changed is downloaded to each client. so network traffic is kept to a minimum. Castanet also includes compression features that offer ISVs a great deal of flexibility in controlling what and how data is compressed. Importantly. applications can be developed to accommodate transparent downloads so a customer's work is never disrupted.

What is Castanet?
Castanet includes client and server software. as well as, a flexible, easy-to-deploy software developers kit (SDK). It consists of four main components: *(AECB would only need to acquire the Transmitter and the UpdateNow™ SDK.)*

1) The Castanet Transmitter: network server software that manages the distribution and maintenance of Castanet applications.
2) The Castanet Tuner: client software that monitors, receives, and manages applications selected by an end user.
3) The Castanet UpdateNow™ SDK: a software developer kit that includes technical documentation, examples, and an extremely lightweight (60 Kbyte) library
4) The Castanet Channel: an application, service or data to be distributed across any TCP/IP network between Castanet Transmitter servers and Tuner clients.

There are two ways Castanet can improve the way developers distribute and manage your applications and services. The first is to develop your applications as Castanet channels, using the Tuner client and Transmitter server software components. The second is to embed the Castanet UpdateNow library into existing applications or services. *(The second option is called for by HCA)*

Once "Castanet-enabled." these existing applications become self-managing and self-updating over the Internet. ISVs can distribute their applications in ways they are accustomed to-- through CD-ROMs or floppies. With the UpdateNow library embedded. these applications no longer need to be manually maintained or updated. and can instead support point-of-use updates over the network (even down to the byte-level). capture user feedback. provide personalization. and support disconnected use. With

UpdateNow SDK. no Tuner is required. Instead the library is integrated into Windows or Java applications so they work directly with the Transmitter. (*The "support disconnected use" feature is important.*)

How is Castanet being used?

Castanet is a proven solution being used by leading ISVs today. For example. MECA Software, a consortium of banks including Citicorp. Bank of America, and Nations Bank is using Castanet to provide an interactive financial services and marketing application for large financial institutions. Cypress Research is deploying Castanet UpdateNow SDK to proactively deliver software updates and fixes as well as provide value-added services to its customers. And Bentana Technologies, an Aetna-funded company, will use Castanet to distribute information and software to customers. agents and employees. including enrollment for customers and financial planning for its field sales force. (*HCA thought that the list of current Castanet users would demonstrate the product viability.*)

To better understand Castanet channels and how they can be applied in the real world. consider these examples:

1) A PC-based tax return application: A commercial application that automates the preparation of tax returns can be made self-updating with the light-weight 60 Kbyte Castanet UpdateNow library. Once embedded. the application will transparently integrate new features and information such as new tax schedules or tips on how to leverage periodic changes in tax laws. The developer can distribute the product via traditional means. such as on CD-ROM or floppy disk through popular retail outlets. Once the product is in the hands of consumers. any changes such as minor updates or software patches, can be securely sent to them over the Internet. The developer only needs to make changes to the application once - on the server - and users will automatically and efficiently receive the updates. With the Castanet solution. the developer enjoys a significant competitive advantage because now users can get new features and tax information immediately (and not just every 12 months or so with each new product release). And since the Castanet system supports disconnected use. customers can work with the application even when off-line. Having such a highly differentiated product increases customer brand loyalty and mind-share. And because new features are sent over the Internet as they happen. the developer can dramatically decrease costs associated with packaging. distribution. and marketing.

2) A mission-critical enterprise application: The developer of a materials management application used by Fortune 1000 enterprises. has embedded the Castanet UpdateNow library into its existing software package. Having done so. the application can be seamlessly updated with new features and capabilities over time. The developer later decides to enhance this product by personalizing the application for each user. Because the Castanet Transmitter server can be extended with "plug-ins" - a piece of code that provides arbitrary server-side analysis or processing - the developer can use a plug-in to change the application's functionality or content "on-the-fly" on a user-by-user basis. In this case. the developer decides to create plug-ins allowing the application to be customized per user in different industry segments. resulting in increased customer satisfaction and demand for its products. The Castanet system also allows the developer to collect valuable usage and preference information to help direct future product development.

Castanet Benefits at a Glance
- Enables self-managing. self-updating applications
- Accommodates iterative development and point-of-use updates
- Decreases time-to-market and cost of goods sold
- Improves brand loyalty and customer retention
- Provides continuous user feedback to application developers
- Supports disconnected portable computers and dial-up users
- Enables personalization on a subscriber-by-subscriber basis
- Distributes and maintains software securely across the Internet
- Employs the most advanced security features in the industry such as authentication. encryption and code signing
- supports applications written in any popular programming language

- Reduces network traffic with leading application update capabilities. including byte-level differential downloads and compression
- Scales to millions of users
- Integrates easily into existing or new applications
- Extremely fast and easy to deploy
- Embedded in every copy of Netscape's Netcaster product for easy. seamless access to Castanet applications
- Cross-platform
- Open. published API. and compliant with industry standards

Name	Castanet Transmitter 1.1
Price	Depends on configuraton: call Marimba Sales for information
Description	The Castanet Transmitter runs on a server machine and serves Castanet channels to Tuners. The Transmitter is extendible by a variety of Transmitter Extensions. New for 1.1: JDK 1.1 support. configurable as Repeater.
Customer	The Castanet Transmitter is designed to distribute and maintain software to employees within a company and to customers and business partners across the Internet.
Platforms	Windows NT 4.0. Windows 95. Solaris 2.5 (*Remember, this is running on the server side (along with the server software and the server-side database) and does not preclude the client end users' use of older versions of Windows.*)
Support	Support provided for 30 days after product purchase date. Support limited to installation and basic product usage questions. Upgraders from 1.0 to 1.1 don't receive additional support.
Maintenance	Includes all maintenance fixes (downloadable from Marimba via internet) for a period of one year from date of purchase. Does not include rights to significant version upgrades.
Prerequisites	none
Requirements	Minimum 16 megabytes of installed RAM Minimum 10 megabytes of free disk space to hold the Transmitter files: you'll need additional disk space for the channels served by the Transmitter.

From Customer Service:

Thanks again for your interest in Marimba. It sounds like you need the per application licensing for Castanet Pro which provides non-Java suppport & security. The cost is US$63 per user (unique users. not concurrent) and requires a minimum purchase of 500 licenses. There is also an 18% maintenance charge.

Appendix H: Pervasive.SQL Technical Information

The Pervasive.SQL server-side database is an update to the older scalable SQL database. Part of the reason for the name change came from the company's acquisition of the Btrieve database technology. The end result is a server-side Btrieve plus scalable databse. The benefit to the AECB is a tremendously enhanced ability to manage the resultant database.

HCA will provid text from Pervasive.SQL to describe some of these features. Our comments are provided in the bracketed text in italics (*like this example.*)

<u>Note</u>: The comments that appear in the following section are the provider's claims for the product.

- Pervasive.SQL: The Total Database Management Solution
- Pervasive.SQL is a unique database management solution precisely architected for the small to midsized business (SMB) marketplace.
- Pervasive.SQL brings you
- The best of both worlds: powerful capabilities and impressive speed.
- Tested, proven reliability.
- A full-featured database engine that's easy to install and support.
- Maintenance-free operations, with no DBA required.
- Compliance with industry standards and the most popular development tools.
- The full support and resources of a marketplace expert committed to the success of Pervasive.SQL developers, consultants, and end users.

The Best of Both Worlds: Transactional and Relational Data Access

Pervasive.SQL delivers the best of both worlds: the performance of transactional data access integrated with the robustness of relational data access, in one industry-leading database engine.

With this unique structure, Pervasive.SQL provides unbeatable transaction processing and maximum programming control combined with exceptionally fast SQL querying and data manipulation.

Pervasive.SQL brings you the ultimate in reliable, maintenance-free, resource-efficient operations, with world-class performance and usability.

Proven Reliability

- Pervasive.SQL's unmatched run-time reliability gives it the strength to dominate middle-market database applications. Pervasive's databases run behind many leading financial and business-critical applications, where accuracy and efficiency are vital, but technical resources are often tight.
- With Pervasive.SQL, each of your database operations is protected through time-tested transaction logging, which automatically caches each step of a transaction until it is finalized. If your server goes down, on power-up Pervasive.SQL automatically rolls back to the last completed transaction.
- Pervasive.SQL eliminates file over-run concerns, as its dynamic file expansion makes space for files as they grow, whether running on a single disk or RAID arrays. Multiuser concurrency and locking are completely managed by the Pervasive.SQL engine down to the record level, allowing no errors, even with hundreds of users accessing the same file. (*While HCA anticipates a hundred users a week, the ability to go to a hundred users at once is good assurance that the AECB will have room to develop.*)
- Real-time features such as continuous operations allow backups while the database is running, and archival logging with roll-forward ensures each and every data entry is securely logged to disk.
- Pervasive.SQL is architected to save your end users time, money, and their valuable data.

Easy to Install and Support

- We've made installation of Pervasive.SQL simple with our InstallScout utility. InstallScout runs during installation of Pervasive.SQL to ensure the client connection to the server is valid, and that the server is up and running.
- In the event of issues with the server, client, or connection between the two, InstallScout walks the user through a series of help screens to get them back on track. In no time, your customers are using their Pervasive-built application - without calling you for support.

(*HCA wanted to be aware of, and provide the best preventative response to, the issues involved in maintaining a web-based or server (host) side database. These issues are addressed here to our satisfaction.*)

Maintenance-Free Operations

Pervasive.SQL frees you from supporting the database behind your applications. Pervasive.SQL features continuous operations, archival logging, and transaction logging to eliminate typical time-consuming database maintenance tasks. Dynamic cache operations, instantaneous file allocation, and index balancing for automatic optimal performance settings drastically reduce the total cost of ownership and enable you to reach markets that cannot afford the ongoing costs of a database administrator.

Standards Support

Pervasive.SQL's commitment to industry standards ensures application portability and interoperability. Pervasive.SQL provides compliance with standards such as ANSI SQL '89 and '92, as well as the SAG CLI definitions. The full Level 2 ODBC Interface provides a high performance, 16-bit and 32-bit seamless connection to third party tools such as Microsoft Visual Basic, Microsoft Access, and all other ODBC-compliant applications. Support for European languages is accomplished through new translation DLLs that provide quick OEM-to-ANSI conversion, reducing the need to rewrite applications for international distribution.

The Tools You Use

At Pervasive, we understand the needs of the commercial developer. That's why we've built strategic alliances with leading tool vendors. Pervasive.SQL supports tools including Microsoft Visual Basic, Borland Delphi, Symantec Visual Café, and more. Plus, Pervasive.SQL has built-in interfaces, sample code, and tutorials for swift connectivity and ease-of-use.

Pervasive Fits Your Needs

Pervasive.SQL stands alone in its ability to deliver enterprise-level power and speed coupled with the lowest cost of ownership in today's marketplace. Pervasive.SQL is specifically built to embed into your applications and insulate your users from database complexities. All they see is your great application, not the database underneath! Plus, unlike Microsoft, Sybase, or Oracle, applications built on Pervasive.SQL for the middle market do not require a DBA.

The Strength of the Channel

Pervasive's comprehensive partner programs form the foundation of our worldwide, channel-focused distribution strategy. Our many programs offer something for all types of developers and resellers - from the small ISV, to the VAR, to the major distributor. Members of our partner programs receive unbeatable service and support, as well as special partner pricing and other incentives.

At Pervasive, we not only deliver the technology you need, we also have people focused directly on your success. In short, our programs and helpful account managers give you virtually everything required to get your products and services the recognition they deserve.

Get Your Hands on Pervasive.SQL

With our channel-focused strategy in mind, we structured our pricing and flexible licensing agreements to allow the mass deployment of applications throughout the SMB marketplace. Rest assured, with competitively priced products from Pervasive, your applications will be up and running - worry-free - in no time.

Pervasive.SQL
Special Introductory Price of $395.00.

Super Charge Development With the PowerPak

Get more power for less money! The DevPartner PowerPak is a custom-designed backpack containing all the utilities required to build powerful, scalable, maintenance-free databases for your applications. And it's available at a special price.

Combine the best databases with the best developer's program and what do you get? The DevPartner PowerPak Program! Now available with an incredible $3,500 discount.

DevPartner PowerPak streamlines database development—and comes with a $3,500 discount!
The DevPartner PowerPak is a custom-designed backpack containing all the utilities required to build powerful, scalable, maintenance-free databases for your applications.
Includes everything you need to develop dynamic applications with powerful, industry-standard Pervasive database products.
Combines the best databases with the best developer's program to give you the most power.

Best of all. you save big! (Promotion list price value is $4.995. but will cost you only $1.500** if you act now.)

- Btrieve v6.15 for Windows DevKit
- Btrieve v6.15 for Windows 95/NT DevKit
- Btrieve v6.15 for DOS DevKit
- Upgrades to PowerPak products available at no cost for 12 months from date of purchase
- 40% Discount Coupon* on Advanced Certification Course (maximum of one student per three-day class)
- Pervasive Software Solution Directory Application
- Two tech support incident packs
- DevKit product updates/patches from Pervasive Software ftp site
- Priority support via PowerPak-only email address (Pervasive will respond to your inquiry within one business day of your request.)

Contains everything required to build high-performance. maintenance-free. totally scalable databases for your applications.

Great price--save $3.500! (Promotion valued at a list price of $4.995. but will cost you only $1.500** if you act now.)

-36-

Appendix I: Brief Program Specifications

1) Assumptions Behind Program Specifications

HCA will submit to the Development Team a complete set of program specifications upon receiving a format description.

2) User Program

The user program is the program that will reside on each end user's machine – be that person the RSO. Licensee. Permit Holder or someone else. At the lowest level of functionality. the user program will have access to the database information that will reside on the server. For the small proportion of users who have no Internet or Web access whatsoever. a regular mailing containing the local copy of the relevant database information will be made available. This function should be available to the person or persons designated as the final System Administrator.

3) User Logon and Security Protocols

Each level of user will receive a different security protocol.

- The user level with the least entitlement will be the employee or staff who reports to the RSO. Licensee or Permit Holder. These people will have access to information. relative ratings of the work environment. but cannot make changes or additions other than their own personal information. They can complete note fields for upward communications with the RSO, Licensee. Permit Holder or an AECB Inspector or agent thereof.
- The mid-level user will be the RSO. Licensee or Permit Holder. They will have access to the information on their own station. can enter. change. or delete information pertinent to their site. but cannot change information left by an AECB Inspector or agent thereof.
- The highest-level user will be the an AECB Inspector or agent thereof. who can add, change, delete or modify information in the records of the RSO. Licensee or Permit Holder.

All "users" will have unlimited access general information. most help screens. and the like (i.e., general level information.) Entry into confidential information or privileged actions will be protected by username and personal identification numbers (PIN codes.)

The log on. activities when logged on. and log off actions will be recorded in an activity log. available to the the RSO. Licensee or Permit Holder. AECB Inspector or agent thereof. and the System Administrator.

4) Automatic Internet Connection

Upon logging on. the user will be asked if they wish to connect to web-based database to receive new information. updates to the database information. and the like.

- If the user chooses to decline. the user can work off-line (i.e.. locally with no real time connection to the server-side database.)
- If the users accepts. the user program will effect the Internet connect. update the user program and log off.

5) Automatic File and Information Update upon Logging On

A number of resources are available to effect the automatic file and information update. HCA is currently recommending the UpdateNow SDK™. although we have received conflicting information regarding pricing. Suffice it to say that the automatic file and information updating can be accomplished by several means.

The updating will be done at the user's discretion. or can be set to automatically update upon starting the program. or be a time-dependent event (e.g.. every night at midnight.)

6) Automatic File and Information Update upon Logging Off

When the user logs off the user program. the program will attempt to automatically update the server-side database.

If the user has no Internet connection whatsoever. the user program will write out a temporary log that can be printed. faxed. saved to disk. and by some means transmitted to the AECB System Administrator.

Given the low likelihood that end users will either have no computer. or have no modem. the chances are good that each user computer can automatically update the server-side database.

7) Tasks Available While Using User Program

Available to User

- Update own personal/site information
- Review past and current ratings. comments and other information about site. including overall grade designation.
- Compare overall ratings to those of other sites
- Compare overall ratings to past ratings for own site
- Review hints. Inspector comments for continuous development
- Create notes and comments for AECB Inspectors
- Allow Administrator to effectively "pre-inspect" the site by following the rating information in the program. The Site Administrator can. effectively. know their grade evaluation before the Inspector's visit thereby facilitating compliance and continuous development. This is a very powerful compliance tool.
- Generate a "To Do" list for every task or behaviour that is currently below standard on the Performance Indicators checklist. With this To Do list comes a stepped progress suggestion, wherein a Pareto diagram is generated that shows the first recommended area for improvement. and sets quantitative goals. based on progress towards the expected value.

Available to AECB Inspectors

- Use the program as a training aid
- Use the program as an educational aid. with the links to relevant documentation. illustrative cases and recommendations for compliance. The Inspectors will not use the program to interpret Regulations. but to provide consistent and concrete examples of superlative compliance.
- Update own personal/site information
- Review past ratings
- Ability to conduct ratings. on-line with Host/Server database. as well as conduct and enter ratings off-line. with automatic upload on next log in.
- Enter Inspection ratings. change. modify delete ratings. comments. and other information about site. including overall grade designation.
- Generate a "To Do" list for every task or behaviour that is currently below standard on the Performance Indicators checklist. With this To Do list comes a stepped progress suggestion, wherein a Pareto diagram is generated that shows the first recommended area for improvement. and sets quantitative goals. based on progress towards the expected value.
- Generate a list of all "To Do" items outstanding for his or her Inspection Clients.

Available to Others at Site

- Update own personal/site information
- Review past ratings
- Query local data about trends for this site only
- Post comments or notes to others who access the user program

8)   Pervasive.SQL Database Functionality

HCA has recommended Pervasive.SQL as the server-side database of choice for a number of reasons. Mostly. is the tremendous resourcefulness available to the AECB System Administrator who will be able to use the extensive reporting and searching abilities of this database. The ability of Pervasive.SQL to meet or exceed current and future needs of the AECB and its progress towards agency-wide performance indicators is a strong feature.

Pervasive.SQL can easily support the needs of the potential 3.800 or so Licensees accessing the database. and has a proven record of performance in applied environments.

With the database comes a need to update the local portions of that database that will reside on the computer of each end user. Marimba's Castanet tool set (e.g., the UpdateNow SKD) has been forwarded as the update tool of choice. HCA is still receiving conflicting reports regarding pricing. but has been told that an economical implementation is possible. At the time of this report. a conference call is scheduled with Marimba senior executives to bring clarity to this matter.

As an aside. HCA is continuing its discussion with GeoWorks and its agents and affiliates (including ˜asio. Nokia and others) to determine when it would be feasible to port the user program to consumer computing devices. The Nokia 9000 Communicator telephone is currently able to run the complete web-based demonstration. including advanced HTML functionality. Web browsing. e-mail. and JavaScript forms submission.

Appendix J: About Dr. Hill and HCA—Assessment Experts

Dr. Timothy D. Hill founded HCA--Assessment Experts in 1985 so organizations could have access to important research findings and management options that are reliable, valid, and of high utility. HCA is an international consulting practice with offices in London, Canada and Kuala Lumpur, Malaysia.

Dr. Hill specializes in Industrial and Organizational Psychology and Psychometrics. He was once the workplace attitudes specialist for one of the world's largest consulting houses on Canada's Bay Street. He felt that human resources should be more than salary and benefits and that many consultants are not trained to be human resources experts. He also felt that most human resources consultants did not provide true service to their clients. The typical HR consultant tends to be a "one article wonder", in that they often read "one article" and then profess expertise in that area. Neither the academic training nor the experience of the typical HR consultant qualifies them to be the providers of these kinds of services. Organizations are the end loser in such a service offering.

He left Bay Street to continue to teach, conduct research, and privately consult to organizations. Dr. Hill was also a (part-time) Assistant Professor in the Psychology Department at the University of Western Ontario for over ten years. He was awarded the title of Western's "Cyber Prof" for his contributions to computer-based training and education. He has also created the "New Topics In Management Series" -- sanctioned by the Ontario Management Development Program.

Tim's long-standing personal interest in New Paradigm organizations has been matched by his research interest in the attitudes and corporate practices of organizations. He is the author of the Satisfaction Research Questionnaire (SRQ), a major new test of workplace attitudes. He has been collecting workplace attitudes data from across Canada for several years, and recently he has been collecting comparison data from Pacific Rim countries.

He wrote the HCA-Utility computer program to show that the dollar impact of human resources decisions are much greater than people suspect. Many of the dollar savings of New Paradigm organizations are the result of prudent management philosophies and practices.

His interest in computer-based training and web-based human resources tools has won accolades for HCA. In 1995, HCA opened a subsidiary part of the consulting practice -- HCA/CourseWare. McGill's Graduate Business School has declared HCA to be one of Canada's premiere virtual organizations. HCA has also been awarded the title of "Best in Class for Human Resources" by the Southwestern Ontario Manufacturer's Association.

He has served as the Quality of Training Advisor to a number of Advisory and Training Development Boards and organizations. He continues to teach and research at Western on a part-time basis. In his spare time, he continues to be involved in the community, teaches English as a second language in the Chinese community, is a licensed pilot, and has been involved in traditional Chinese martial arts since the sixth grade of public school.

Appendix K: Selected Bibliography

Abdel-Halim. A.A. (1980). Effects of higher order need strength on the job performance-job satisfaction relationship. Personnel Psychology. 33. 335-347.

Abelson. R.P. (1985). A variance explanation paradox: When a little is a lot. Psychological Bulletin. 97. 129-133.

Akerlof. G.A.. Yellen. J.L.. & Rose. A.K. (1988). Job switching and job-satisfaction in the United States labour market. Brookings Papers on Economic Activity. 2. 495-594.

Alexander. R.A.. & Barrick. M.R. (1987). Estimating the standard error of projected dollar gains in utility analysis. Journal of Applied Psychology. 72. 475-479.

American Psychological Association. (1981). Ethical principles of psychologists. American Psychologist. 36. 633-638.

Anastasi. A. (1982). Psychological testing. (4th ed.). New York: Macmillan.

Arndt. S.. Clevenger. J.. & Meiskey. L. (1985). Students' attitudes toward computers. Special Issue: Social impact of computers. Computers and the Social Sciences. 1(3-4), 181-190.

Arnold. H.J.. & Feldman. D.C. (1981). Social desirability response bias in self-report choice situations. Academy of Management Journal. 24. 377-385.

Aronsson. G. (1989). Dimensions of control as related to work organization. stress. and health. International Journal of Health Services. 19. 459-468.

Arvey. R.D.. & Ivancevich. J.M. (1980). Punishment in organizations: A review. propositions. and research suggestions. Academy of Management Review. 5. 123-132.

Ashford. S.F.. & Cummings. L.L. (1983). Feedback as an individual resource: Personnel strategies for creating information. Organizational Behavior and Human Performance. 32. 370-398.

Atkin. R.S.. & Conlon. E.J. (1978). Behaviorally anchored rating scales: Some theoretical issues. Academy of Management Review. 3. 119-128.

Baldwin. T.T.. & Ford. J.K. (1988). Transfer of training: A review and directions for future research. Personnel Psychology. 41. 63-105.

Banks. C.G.. & Murphy. K.R. (1985). Toward narrowing the research-practice gap in performance appraisal. Personnel Psychology. 38. 338-345.

Barling. J.. & Rosenbaum. A. (1986). Work stressors and wife abuse. Journal of Applied Psychology, 71, 346-348.

Bartlett. C.J. (1978). Equal employment opportunity issues in training. Human Factors. 20. 179-188.

Bass. B.M.. & Barrett. G.V. (1981). People. work. and organizations (2nd ed.). Boston: Allyn & Bacon.

Bass. B.M.. & Vaughan. J.A. (1966). Training in industry: The management of learning. Pacific Grove. CA: Brooks/Cole.

Basset. G.A.. & Meyer. H. (1968). Performance appraisal based on self-review. Personnel Psychology, 21, 421-430.

Bateman. T.S.. & Organ. D.W. (1983). Job satisfaction and the good soldier: The relationship between affect and employee "citizenship". Academy of Management Journal. 26, 587-595.

Beehr. T.A. (1976). Perceived situational moderators of the relationship between subjective role ambiguity and role strain. Journal of Applied Psychology. 61. 35-40.

Beehr. T.A.. Walsh. J.T.. & Taber. T.D. (1976). Relation of stress to individually and organizationally valued states. Journal of Applied Psychology. 61. 41-47.

Bentler. P.M.. & Bonnett. D.C. (1980). Significance tests and goodness of fit in the analysis of covariance structures. Psychological Bulletin. 88. 588-606.

Bequai. A. (1983). How to prevent computer crime: A guide for managers. New York: John Wiley & Sons.

Bernardin. H.J.. Cardy. R.L.. & Carlyle. J.J. (1982). Cognitive complexity and appraisal effectiveness: Back to the drawing board? Journal of Applied Psychology. 61. 564-570.

Bernardin. H.J.. & Kane. J.S. (1980). A second look at behavioral observation scales. Personnel Psychology. 33. 809-814.

Blair. N.L.. & Jackson. D.N. (1978). Inferring vocational interest. Research Bulletin # 435. Department of Psychology. University of Western Ontario. London. Ontario. Canada.

Bobko. P.. Karren. R.. & Kerkar. S.P. (1987). Systematic research needs for understanding supervisory-based estimates of SDy in utility analysis. Organizational Behavior and Human Decision Processes. 40. 69-95.

Bobko, P., Karren, R., & Parkington, J. (1983). Estimation of standard deviations in utility analyses: An empirical test. Journal of Applied Psychology, 68, 170-176.

Boehm, V.R. (1980). Research in the "real world" — A conceptual model. Personnel Psychology, 33, 495-504.

Borman, W.C. (1978). Exploring upper limits of reliability and validity in job performance ratings. Journal of Applied Psychology, 63, 135-144.

Boudreau, J.W., & Rynes, S.L. (1985). Role of recruitment in staffing utility analysis. Journal of Applied Psychology, 70, 354-366.

Bowles, J., & Hammond, J. (1991). Being Baldridge-Eligible isn't enough. New York Times, Forum, p. F13.

Brayfield, A.H., & Crockett, W.H. (1955). Employee attitudes and employee performance. Psychological Bulletin, 52, 396-424.

Brent, E.E. (1985). Relational data base structures and concept formation in the social sciences. Computers and the Social Sciences, 1(1), 29-49.

Brethorver, K.S. (1976). Programmed instruction. In R.L. Craig (Ed.), Training and development handbook (2nd ed.). New York: McGraw-Hill.

Brissie, J.S., Hooverdempsey, K.V., & Bassler, O.C. (1988). Individual, situational contributors to teacher burnout. Journal of Educational Research, 82, 106-112.

Brunr, J.S., Tagiuri, R. (1954). The perception of people. In G. Lindzey (Ed.), Handbook of Social Psychology. Vol. II. Cambridge, MA: Addison-Wesley.

Bunker, K.A., & Cohen, S.L. (1977). The rigors of training evaluation: A discussion and field demonstration. Personnel Psychology, 30, 525-541.

Bure, M.J., & Day, R.R. (1986). A cumulative study of the effectiveness of managerial training. Journal of Applied Psychology, 71, 232-246.

Burke, M.J., & Frederick, J.T. (1984). Two modified procedures for estimating standard deviation in utility analyses. Journal of Applied Psychology, 69, 482-489.

Burke, R.J. (1989). Toward a phase model of burnout - some conceptual and methodological concerns. Group and Organization Studies, 14, 23-32.

Burke, R.J., & Greenglass, E.R. (1989). It may be lonely at the top but its less stressful - psychological burnout in public-schools. Psychological Reports, 64, 615-623.

Burke, R.J., & Greenglass, E.R. (1989). Psychological burnout among men and women in teaching - an examination of the Cherniss model. Human Relations, 42, 261-273.

Burke, R.J., Weitzel, W., & Weir, T. (1978). Characteristics of effective employee performance review and development interviews: Replications and extensions. Personnel Psychology, 31, 903-919.

Burke, R.J., & Wilcox, D.S. (1969). Characteristics of effective employee performance review and adjustment interviews. Personnel Psychology, 22, 291-305.

Burron, B.F., Carlson, K.A., Getty, G.R., Jackson, D.N. (1971). The effects of informational characteristics on the perception of real and hypothetical target persons. Psychonomic Science, 23, 145-147.

Business Japan. (1987). New industrial revolution and Japanese business — Business leaders view the future of industry and society. Business Japan, 8, 37-42.

Buunk, B.P., Janssen, P.P.M., & Vanyperen, N.W. (1989). Stress and affiliation reconsidered - the effects of social support in stressful and non-stressful work units. Social Behaviour, 4, 155-171.

Campbell, D.T., & Fiske, D.W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. Psychological Bulletin, 56, 81-105.

Campbell, J.P. (1971). Personnel training and development. Annual Review of Psychology 22, 565-602.

Campbell, J.P., Daft, R.L., & Hulin, C.L. (1982). What to study: Generating and developing research questions. Newbury Park, CA: Sage.

Campbell, J.P., Dunnette, M.D., Arvey, R., & Hellervik, L. (1973). The development and evaluation of behaviourally based rating scales. Journal of Applied Psychology, 57, 15-22.

Campion, M.A., & Campion, J.E. (1987). Evaluation of an interviervee skills training program in a natural field experiment. Personnel Psychology, 40, 675-691.

Carlston, D. (1980). Events, inferences, and impression. In R. Hastie (Ed.), Person memory: The cognitive basis of social perception. Hillsdale, NJ: Erlbaum.

Cascio, W.F. (1978). Applied psychology in personnel management. Reston, VA: Reston Publishing Company, Inc.

Cascio, W.F. (1980). Responding to the need for accountability: A critical analysis of three utility models.

Organizational Behavior and Human Performance, 25, 32-45.

Cascio, W.F. (1982). Costing human resources: The financial impact of behavior in organizations. Boston: Kent.

Cascio, W.F., & Bernardin, H.J. (1981). Implications of performance appraisal litigation for personnel decisions. Personnel Psychology, 34, 211-226.

Cascio, W.F., & Ramos, R.A., (1986). Development and application of a new method of assessing job performance in behavioral/economic terms. Journal of Applied Psychology, 71, 20-28.

Catalanello, R.E., & Kirkpatrick, D.L. (1968). Evaluating training programs: The state of the art. Training and Development Journal, 22, 2-9.

Cederblom, D. (1982). The performance appraisal interview: A review, implications, and suggestions. Academy of Management Review, 7, 219-227.

Chooi, C.M.M., & Hill, T.D. (1989). A summary review of the general findings in the performance appraisal literature. Department of Psychology Research Bulletin # 685, The University of Western Ontario.

Cleary, T.A., & Hilton, T.I. (1968). Test bias: Prediction of grades of Negro and white students in integrated colleges. Journal of Educational Measurement, 5, 115-124.

Cleveland, J.N., Murphy, K.R., & Williams, R.E. (1989). Multiple uses of performance appraisal: Prevalence and correlates. Journal of Applied Psychology, 74, 130-135.

Cohen, J., & Cohen, P. (1975). Applied multiple regression/correlation analysis for the behavioral sciences. Hillsdale, NJ: Lawrence-Erlbaum.

Cole, R. (1979). Work, mobility, and participation. A comparative study of American and Japanese industry. Berkley, CA: University of California Press.

Cole, R.E. (1981). Labour in Japan. In B.M. Richardson & T. Ueda (Eds.), Business and society in Japan. New York: Praeger.

Cook, J.D., Hepworth, S.J., Wall, T.D., & Warr, P.B. (1981). The experience of work: A compendium and review of 249 measures and their use. London: Academic Press.

Cooley, W.W. (1971). Techniques for considering multiple measurements. In R.L. Thorndike (Ed.), Educational measurement (2nd. ed.). Washington, DC: American Council of Education. pp. 601-622.

Cooper, C.L., & Levine, N. (1978). Implicit values in experimental learning groups: Their functional and dysfunctional consequences. In D.L. Cooper & C. Alderfer (Eds.), Advances in experimental social processes. New York: Wiley.

Cooper, W.H. (1981). Ubiquitous halo. Psychological Bulletin, 90, 218-244.

Coppard, L.C. (1976). Gaming simulations and the training process. In R.L. Craig (Ed.), Training and development handbook (2nd ed.). New York: McGrarv-Hill.

Cronbach, L.J., & Furby, L. (1970). How should we measure change -- or should we? Psychological Bulletin, 74, 68-80.

Cronbach, L.J., & Gleser, G.C. (1965). Psychological tests and personnel decisions. Chicago, IL: University of Illinois Press.

Cronbach, L.J., & Meehl, P.E. (1955). Construct validity in psychological tests. Psychological Bulletin, 52, 281-302.

Cronbach, L.J., & Warrington, W.G. (1952). Efficiency of multiple-choice tests as a function of spread on item difficulties. Psychometrika, 17, 127-147.

Cronshaw, S.F., & Alexander, R.A. (1985). One answer to the demand for accountability: Selection utility as an investment decision. Organizational Behavior and Human Decision Processes, 35, 102-118.

Cruikshank, J. (1989). Burnout - an issue among Canadian community-development workers. Community Development Journal, 24, 40-54.

Cummings, L.L., & Schwab, D.P. (1978). Designing appraisal systems for information yield. California Management Review, 20, 18-25.

Darlington, R.B. (1971). Another look at "cultural fairness". Journal of Educational Measurement, 8, 71-82.

Darly, J.G., & Hagenah, T. (1955). Vocational interest measurement: Theory and practice. Minneapolis: The University of Minnesota Press.

Dawis, R.V., England, G.W., & Lofquist, L.H. (1964). Minnesota studies in vocational rehabilitation: XV A theory of work adjustment. Minneapolis, MN: Industrial Relations Center, University of Minnesota Press.

Deming, W.E. (1989). Foreward. In Walton, M. The Deming management method. W.H. Allen and Co.:

Melbourne, Victoria.

Deves, L., & Spillane, R. (1989). Occupational-health, stress, and work organization in Australia. International Journal of Health Services, 19, 351-363.

Dipboye R.L., & Flanagan, M F. (1979) Research settings in industrial and organizational psychology. American Psychologist, 34, 141-150.

Disalvo, V., Lewis, J., Rossi, A.M., & Lubbers, C. (1988). The impact of gender on work-related stress. Journal of Social Behaviour and Personality, 3, 161-176.

Dossett, D.L., & Hulvershorn, P. (1983). Increasing technical training efficiency: Peer training via computer-assisted instruction. Journal of Applied Psychology, 68, 552-558.

Doyle, T. (1988). Social security comparison. Paper presented at the Osaka and Tokyo Conference. Investing in North America: The human resources issues.

Doyle, T., and Hill, T.D. (1988). Nondiscrimination for employee benefit plans in the United States. Paper presented at the Osaka and Tokyo Conferece. Investing in North America: The human resources issues.

Drake, D. (1989). Feeling better on burnout. Library Journal, 114, 12-12.

Draper, N., & Smith, H. (1981). Applied regression analysis. (2nd. ed.). John Wiley and Sons: New York.

Drory, A., & Shamir, B. (1988). Effects of organizational and life variables on job-satisfaction and burnout. Group & Organization Studies, 13, 441-455.

Drucker, P. (1976). The coming rediscovery of scientific management. Conference Review Board, 13, 23-27.

Dumas, G., & Hill, T.D. (1988). Strategies for investing in the United States. Paper presented at the Osaka and Tokyo Conferece. Investing in North America: The human resources issues.

Dunnette, M.D. (1966) Fads, fashions, and folderol in psychology. American Psychologist, 21, 343-352.

Dunnette, M.D., & Borman, W. (1979). Personnel selection and classification systems. Annual Review of Psychology, 30, 477-526.

Dupre, V.A. (1976) . Human relations laboratory training. In R.L. Craig (Ed.), Training and development handbook (2nd ed.). New York: McGraw-Hill.

Dutton, W., Kovaric, P., & Steinfield, C. (1985). Computing in the home: A research paradigm. Computers and the Social Sciences, 1(1), 5-18.

Eden, D., & Shani, A.B. (1982). Pygmalion goes to boot camp: Expectancy, leadership, and trainee performance. Journal of Applied Psychology, 67, 194-199.

Edwards, A.L. (1957). The social desirability variable in personality assessment and research. New York: Dryden.

Edwards, A.L. (1963). A factor analysis of experimental social desirability and response set scales. Journal of Applied Psychology, 47, 308-316.

Emmott, W. (1988). The limits to Japanese power. The AMEX Bank Review Special Papers Series, 16, pp. 5-24.: London, England.

Fear, R.A. (1984). The evaluation interview. Toronto: McGreaw-Hill.

Fekken, G.C., & Jackson, D.N. (1984). Predicting psychological test item response stability. Paper presented at the Annual convention of the Canadian Psychological Association, Ottawa.

Feldman, J.M. (1981). Beyond attribution theory: Cognitive processes in performance appraisal. Journal of Applied Psychology, 66, 127-148.

Flanagan, M.F., & Dipboye, R L. (1981) Research settings in industrial and organizational psychology: Facts fallacies, and the future. Personnel Psychology, 34, 37-47.

Fletcher, J.M., & Hill, T.D. (1996). CAT – Computer Assisted Training for Radiation Safety: Surfing the new wave in teaching technology. Paper presented at the annual convention of the Canadian Radiation Protection Association, Trois-Rivieres, Quebec.

Fletcher, J.M., & Hill, T.D. (1997). The Behavioural Observation Scale (BOS) needs assessment: A process to facilitate positive development in radiation safety training and compliance. Paper presented at the annual convention of the Canadian Radiation Protection Association, Victoria, B.C.

Fletcher, J.M., & Hill, T.D. (1997). The Behavioural Observation Scale (BOS) for radiation safety training and compliance. Paper presented at the annual convention of the Canadian Radiation Protection Association, Victoria, B.C.

Fletcher, J.M., & Hill, T.D. (1997). Success during change: Strategies for more effective Radiation Safety training in hospitals and universities. Paper prepared for presentation at the annual convention of

the Canadian Radiation Protection Association, Ottawa, Ontario.

Fletcher, J.M., & Hill, T.D. (1997). Measuring your training needs in the 90's (No, not *those* kinds of needs!) Invited workshop prepared for presentation at the annual convention of the Canadian Radiation Protection Association, Ottawa, Ontario.

Ford, J.K., & Wroten, S.P. (1984). Introducing new methods for conducting training evaluation and for linking training evaluation to program redesign. Personnel Psychology, 37, 651-666.

Fredericksen, N. (1961). In-basket tests and factors in administrative performance. In H. Guetzkow (Ed.), Simulation in Social Science: Reading. Englewood Cliffs, NJ: Prentice Hall.

Freeberg, N.E. (1976). Criterion measures for youth-work training programs: The development of relevant performance dimensions. Journal of Applied Psychology, 65, 517-545.

French J.R.P., Kay, E., & Meyer, H. (1966). Participation and the appraisal system. Human Relations, 19, 3-20.

Friedman, M. (1969). Pathogenesis of coronary artery disease. New York: McGraw-Hill.

Frienig, H.S., Lee, K.F., Rodstrom, C.M., Hill, T.D. (1993). An Industrial and Organizational Psychology primer. London, Ontario: HCA--Assessment Experts.

Gable, M., & Topol, M.T. (1989). Machiavellianism and job-satisfaction of retailing executives in a specialty store chain. Psychological Reports, 64, 107-112.

Gabrenya, W.K., Jr., Wang, Y.E., & Latane, B. (1985). Cross-cultural differences on optimizing a task: Chinese and Americans. Journal of Cross-Cultural Psychology, 16, 223-242.

Garden, A.M. (1989). Burnout - the effect of psychological type on research findings. Journal of Occupational Psychology, 62, 223-234.

Garvin, D.A. (1986). Quality problems, policies, and attitudes in the United States and Japan: An exploratory study. Academy of Management Journal, 29, 653-673.

Ghiselli, E.E. (1956). The placement of workers: Concepts and problems. Personnel Psychology, 9, 1-16.

Ghiselli, E.E. (1974). Some perspectives for industrial psychology. American Psychologist, 29, 80-87.

Glass, D.C. (1977). Behavior patterns, stress and coronary disease. Hillsdale, NJ: Erlbaum.

Glennon, J.R., Owens, W.A., Smith, W.J., & Albright, L.E. (1960). New dimension in measuring moral. Harvard Business Review, 38, 106-107.

Goldband, S. (1980). Stimulus specificity of physiological response to stress and the Type A coronary-prone behavior pattern. Journal of Personality and Social Psychology, 39, 670-679.

Goldman, R.B. (1976). A work experiment: Six Americans in a Swedish plant. New York: Ford Foundation.

Goldstein, I.L. (1974). Training: Program development and evaluation. Monterey, CA: Brooks/Cole.

Goldstein, I.L. (1978). The pursuit of validity in the evaluation of training programs. Human Factors, 20, 111-144.

Goldstein, I.L. (1980a). Training and organizational psychology. Professional Psychology, 11, 421-427.

Goldstein, I.L. (1980b). Training in work organizations. Annual Review of Psychology, 31, 229-272.

Goodale, J.G., & Aagaard, A.K. (1975). Factors relating to varying reactions to the 4-day workweek. Journal of Applied Psychology, 60, 33-38.

Gray, D., & Calsyn, R.J. (1989). The relationship of stress and social support to life satisfaction - age effects. Journal of Community Psychology, 17, 214-219.

Greem, S.G., & Mitchell, T.R. (1979). Attributional processes of leaders in leader-member interactions. Organizational Behavior and Human Performance, 23, 429-458.

Greene, J.R. (1989). Police officer job-satisfaction and community perceptions -- implications for community-oriented policing. Journal of Research in Crime and Delinquency, 26, 168-183.

Greenglass, E.R., Pantony, K.L., & Burke, R.J. (1988). A gender-role perspective on role-conflict, work stress and social support. Journal of Social Behaviour and Personality, 3, 317-328.

Greller, M.M. (1975). Subordinate participation and reaction to the appraisal interview. Journal of Applied Psychology, 60, 544-549.

Greller, M.M. (1978). The nature of subordinate participation in the appraisal interview. Academy of Management Journal, 21, 646-658.

Greller, M.M., & Herold, D.M. (1975). Sources of feedback: A preliminary investigation. Organizational Behavior and Human Performance, 13, 244-256.

Guadagnoli, E., & Velicer, W.F. (1988). Relation of sample size to the stability of component patterns. Psychological Bulletin, 103, 265-275.

Guion, R.M. (1965). Personnel testing. New York: McGraw-Hill.

Guion, R.M. (1981). Problems of measurement in organizational psychology. In J.A. Sgro (Ed.), Virginia Tech symposium on applied behavioral sciences. Vol.1. Lexington, Mass.: Lexington. Pp. 233-255.

Guion, R.M., & Gottier, R.F. (1965). Validity of personality measures in personnel selection. Personnel Psychology, 18, 135-164.

Gundry, L. (1985). Computer technology and organizational culture. Special Issue: Social impact of computers. Computers and the Social Sciences, 1(3-4), 163-166.

Guxxo, R.A., Jette, R.D., & Katxell, R.A. (1985). The effects of psychologically based intervention programs on worker productivity: A meta-analysis. Personnel Psychology, 38, 275-291.

Hackman, J.R. (1986). The design of work teams. In J. Lorsch (Ed.), Handbook of organizational behavior. Englewood Cliffs, NJ: Prentice Hall.

Hackman, J.R., & Lawler, E.E. (1971). Employee reactions to job characteristics. Journal of Applied Psychology, 55, 259-286.

Hakel, M.D., Hollman, T.D., & Dunnette, M.D. (1970). Accuracy of interviewers, certified public accountants, and students in identifying the interests of accountants. Journal of Applied Psychology, 54, 115-119.

Hand, H.H. & Slocum, J.W., Jr. (1972). A longitudinal study of the effects of a human relations training program on management effectiveness. Journal of Applied Psychology, S6, 412-417.

Harkins, S.G., & Jackson, S.M. (1985). The role of evaluation in eliminating social loafing. Personality and Social Psychology Bulletin, 11, 457-465.

Harkins, S.G., Latane, B., & Williams, K. (1980). Social loafing: Allocating effort or taking it away? Journal of Experimental Social Psychology, 16, 457-465.

Hawk, R.H. (1967). The recruitment function. New York: American Management Association.

Hellerstein, L.N.(1985). The social use of electronic communication at a major university. Special Issue: Social impact of computers. Computers and the Social Sciences, 1(3-4), 191-197.

Herzberg, F., Mausner, B., Peterson, R.O., & Capwell, D.F. (1957). Job attitudes: Review of research and opinion. Pittsburgh, PA: Psychological Service of Pittsburgh.

Hill, T.D. (1983). Personality, test validity, and the employment interview. Paper presented at the annual thesis conference, Hamilton, Ontario, Canada.

Hill, T.D. (1984). Brief form of the Multidimensional Aptitude Battery (MAB). Department of Psychology Research Bulletin # 617, University of Western Ontario, London, Ontario, Canada.

Hill, T.D. (1985a). The Satisfaction Research Questionnaire (SRQ). V.01. Research Psychologists Press: Port Huron, MI.

Hill, T.D. (1985b). Job satisfaction since 1977. Department of Psychology Research Bulletin # 635, University of Western Ontario, London, Ontario, Canada.

Hill, T.D. (1985c). Item format and structure of the Basic Personality Inventory. Unpublished Master of Arts Thesis, Department of Psychology, University of Western Ontario.

Hill, T.D. (1986). Job satisfaction: A proposal for construct validity. Research Bulletin No. 640. Department of Psychology, University of Western Ontario, London, Ontario, Canada.

Hill, T.D. (1987). The construct-valid assessment of job satisfaction: Consequences for stress in the workplace. Research Bulletin # 666, Department of Psychology, University of Western Ontario, Canada.

Hill, T.D. (1988a). Is it finally time to recognize F.W. Taylor? Department of Psychology Research Bulletin # 668, University of Western Ontario, London, Ontario, Canada.

Hill, T.D. (1988b). The construct-valid assessment of job satisfaction: Consequences for stress in the workplace. Doctoral dissertation, Department of Psychology, University of Western Ontario, Canada.

Hill, T.D. (1988c). Measurement concerns in job satisfaction: What about that mean correlation? Paper presentedat the Annual Convention of the Canadian Psychological Association.

Hill, T.D. (1989). HCA-Utility: A computer program to bring utility theory to Canadian business. London, Ontario, Canada: HCA--Assessment Experts.

Hill, T.D. (1989). HCA-WHMIS: Canada's first computer-based WHMIS training program. London, Ontario, Canada: HCA--Assessment Experts.

Hill, T.D. (1990). Manual for the Satisfaction Research Questionnaire (SRQ). London, Canada: HCA--Assessment Experts.

Hill, T.D. (1990). The Satisfaction Research Questionnaire (SRQ). London, Ontario: HCA--Assessment

Experts.

Hill, T.D. (1991). Applying our skills as Industrial and Organizational Psychologists in the Canadian work environment. Invited address, University of Guelph.

Hill, T.D. (1991). Cookies, cars, and computers: Reliability, validity, and utility is everywhere. Invited address to the Federal Institute of Management. London, Ontario, Canada.

Hill, T.D. (1991). The Satisfaction Research Questionnaire (SRQ): A Canadian workplace attitude assessment instrument. Paper prepared for presentation at the annual convention of the Canadian Psychological Association, 1991.

Hill, T.D. (1992). A research monograph for the Satisfaction Research Questionnaire (SRQ).

Hill, T.D. (1992). How the ASEAN countries can avoid the failures of North American economy. Invited address. Kuala Lumpur. Malaysia.

Hill, T.D. (1992). Understanding the management practices of the Pacific Rim. (3rd ed.). London, Ontario, Canada: HCA--Assessment Experts.

Hill, T.D. (1992). Wither the PS200 Initiative? Cookies, Cars, & Computers. Ottawa: Invited address to the Federal Institute of Management.

Hill, T.D. (1993). ADVANCE IK5 Continuous improvement for careers. London, Ontario, Canada: HCA--Assessment Experts.

Hill, T.D. (1993). Our future as decision-makers: Where is our utility? Invited address, AIESEC's Global Themes Conference, London Ontario.

Hill, T.D. (1993). Understanding the management practices of the Pacific Rim. (3rd ed., rev.). London, Ontario, Canada: HCA--Assessment Experts.

Hill, T.D. (1993). What about satisfaction's mean correlation with performance? Paper presented at the Annual Convention of the Canadian Psychological Association.

Hill, T.D. (1994). Canadian organizations as players on the world's economic stage: Get a new script. Invited address, AIESEC's International Commerce Conference, Waterloo, Ontario.

Hill, T.D. (1995). ADVANCE IK5: International career development. (Computer-based training program) London, Ontario, Canada: HCA/CourseWare.

Hill, T.D. (1995). ADVANCE IK5: Outplacement. (Computer-based training program) London, Ontario, Canada: HCA/CourseWare.

Hill, T.D. (1995). Managing the "human performance" of nuclear power generating station supervisors. Invited address presented at the WANO sponsored Shift Supervisors Professional Development Seminars, Toronto, Canada.

Hill, T.D. (1995). Understanding the management practices of the Pacific Rim. (4th ed.). London, Ontario, Canada: HCA--Assessment Experts.

Hill, T.D. (1995). When your staff surfs the Net at work, how do you know they're not playing DOOM? Invited address to the McGill Graduate Business Conference, "Managing technology: Strategy, ethics and the human element". Montreal, Canada.

Hill, T.D. (1996). Amaeru in Canada: Getting it right, here! Invited address to the McGill Graduate Business Conference, "From Insight To Action". Montreal, Canada.

Hill, T.D. (1997). An Industrial and Organizational Psychology primer. (Web-based version.) London, Ontario: HCA/CourseWare.

Hill, T.D. (1997). The Career and resume toolkit on CD. London, Ontario: HCA/CourseWare.

Hill, T.D. (1997). Understanding the management practices of the Pacific Rim. (Web-based version.) London, Ontario: HCA--Assessment Experts.

Hill, T.D. (1998, in progress). Kaizen: A measurable approach to continuous improvement in the Canadian workplace.

Hill, T.D. (1998, in progress). No more BS: The truth about The Body Shop.

Hill, T.D. (1998, in progress). Frederick Taylor's "The Principles of Scientific Management" Revised and annotated.

Hill, T.D., Chooi, M.C.M. (1989). Simple multicollinearity diagnostics for I/O Psychology. Department of Psychology Research Bulletin #679, University of Western Ontario, London, Ontario, Canada.

Hill, T.D., Chooi, M.C.M., & Gallant, A.T. (1991). Measuring workplace attitudes and career expectations: "My job", someone else's job, and the mythical "best" job. Unpublished paper.

Hill, T.D., Chooi, M.C.M., & Gallant, A.T. (1991). The Career Obstacles Questionnaire. London, Ontario, Canada: Psychology Press International.

Hill, T.D., & Gallant, A.T. (1993). High utility applications in outplacement and career development.

Invited address to the Woodstock Personnel Association. Woodstock, Ontario, Canada.

Hill, T.D., Gallant, A.T., & Chooi, M.C.M. (1989). Career Assessment Planning Service: Outplacement (CAPS-I). HCA--Assessment Experts: London, Ontario, Canada.

Hill, T.D., Gallant, A.T., & Chooi, M.C.M. (1990). Career Assessment Planning Service: Career Development (CAPS-2). HCA--Assessment Experts: London, Ontario, Canada.

Hill, T.D., & Jackson, D.N. (1983). Personality, test validity, and the employment interview. Paper presented at the annual convention of the Canadian Psychological Association, Manitoba, Winnipeg, Canada.

Hill, T.D., & Jackson, D.N. (1984a). Brief form of the Multidimensional Aptitude Battery (MAB). Paper presented at the annual convention of the American Psychological Association, Toronto, Ontario, Canada.

Hill, T.D., & Jackson, D.N. (1984b). Parallel forms for the Basic Personality Inventory. Department of Psychology Research Bulletin # 616, University of Western Ontario, London, Ontario, Canada.

Hill, T.D., & Jackson, D.N. (1987a). A modern perspective on job satisfaction assessment and classification. Paper presented at the annual convention of Division 14 of the American Psychological Association, Dallas, Texas.

Hill, T.D., & Jackson, D.N. (1987b). The construct-valid assessment of satisfaction: Consequences for stress in the workplace. Paper presented at the annual convention of the Canadian Psychological Association, Vancouver, British Columbia.

Hill, T.D., & McGarry, M. (1995). Results of a pilot study with HCA's Human Performance Management Systems (HPMS™) and nuclear power generating station supervisors. Paper presented at the annual convention of the International Atomic Energy Association, Hartford, CT.

Hill, T.D., Reddon, J.R., & Jackson, D.N. (1983). Classification of intelligence by the factor analytic method. Paper presented at the annual convention of the Classification Society, North American Branch, Philadelphia, PA.

Hill, T.D., Reddon, J.R., & Jackson, D.N. (1985). The factor structure of the Wechsler scales: A brief review. Clinical Psychology Review, 5, 287-306.

Hill, T.D., & Waring, E.M. (1984). The WIQ: The assessment of intimacy. Paper presented at the annual convention of the Canadian Psychological Association, Ottawa, Ontario, Canada.

Himle, D.P., Jayaratne, S., & Thyness, P.A. (1989). The buffering effects of 4 types of supervisory support on work stress. Administration in Social Work, 13, 19-34.

Hinrichs, J. (1976). Personnel training. In M.D. Dunnette (Ed.), Handbook of industrial and organizational psychology, Skokie, IL: Rand McNally.

Hofheinz, R., Jr., & Calder, K.E. (1982). The eastasia edge. New York: Basic Books.

Holland, J.L. (1966). A psychological classification scheme for vocations and major fields. Journal of Counselling Psychology, 13, 278-288.

Holland, J.L. (1973). Making vocational choices: A theory of careers. Engelwood Cliffs, NJ: Prentice-Hall.

Holzbach, R.L. (1978). Rater bias in performance ratings: Supervisor, self-, and peer ratings. Journal of Applied Psychology, 63, 579-588.

Hoppock, R. (1935). Job satisfaction. New York: Harper.

Hoppock, R. (1967). Occupational information. (3rd ed.). New York: McGraw-Hill.

Horn, J.L., McArdle, J.J., & Mason, R. (1983). When is invariance not invariant: A practical scientist's look at the ethereal concept of factor invariance. The Southern Psychologist, 1, 179-188.

Houston, B.K., & Kelly, K.E. (1989). Hostility in employed women - relation to work and marital experiences, social support, stress, and anger expression. Personality and Social Psychology Bulletin, 15, 175-182.

Hsu, L.M. (1983). Dependence of the relative productivity gains of two personnel selection tests on the applicant pool size. Applied Psychological Measurement, 7, 359-365.

Huff, D. (1954). How To Lie With Statistics. W.W. Norton & Co.: New York.

Hughes, J.L., & McNamara, W.J. (1961). A comparative study of programmed and conventional instruction in industry, Journal of Applied Psychology, 45, 225-231.

Humphris, G.M., & Turner, A. (1989). Job-satisfaction and attitudes of nursing staff on a unit for the elderly severely mentally infirm, with change of location. Journal of Advanced Nursing, 14, 298-307

Hunter, J.E., Schmidt, F.L., & Coggin, T.D. (1988). Problems and pitfalls in using captial budgeting and financial accounting techniques in assessing the utility of personnel programs. Journal of Applied

Psychology, 73, 522-528.

Hunter, J.E., Schmidt, F.L., & Jackson, G.B. (1982). Meta-Analysis: Cumulating research findings across studies. Beverly Hills, CA: Sage.

Hunter, J.E., Schmidt, F.L., & Rauschenberger, J.M. (1977). Fairness of psychological tests: Implications of four definitions for selection utility and minority hiring. Journal of Applied Psychology, 62, 245-260.

Iaffaldano, M.T., & Muchinsky, P.M. (1985). Job satisfaction and job performance: A meta-analysis. Psychological Bulletin, 97, 251-273.

Ilgen, D.R., Fisher, C.D., & Taylor, M.S. (1979). Motivational consequences of individual feedback on behavior in organizations. Journal of Applied Psychology, 64, 349-371.

Ilgen, D.R., Mitchell, T.R., & Frederickson, J.W. (1981). Poor performers: Supervisors' and subordinates' responses. Organizational Behavior and Human Performance, 27, 386-410.

Ilgen, D.R., & Moore, C.F. (1987). Types and choices of performance feedback. Journal of Applied Psychology, 72, 401-406.

Ilgen, D.R., Peterson, R.B., Martin, B.A., & Boeschen, D.E. (1981). Supervisor and subordinate reactions to performance appraisal sessions. Organizational Behavior and Human Performance, 28, 311-330.

Imberman, W. (1992). New union militancy in assembly plants. Assemby, February/March, 58.

Innes, E., Perry, R.L., & Lyon, J. (1986). The Financial Post selects the 100 best companies to work for in Canada. Toronto: Collins:

Jackson, D.N. (1967). Personality Research Form Manual. Port Huron, MI: Research Psychologists Press.

Jackson, D.N. (1970). A sequential system for personality scale development. In C.D. Speilberger (Ed.), Current Topics in Clinical and Community Psychology. Vol 2. New York: Academic Press. Pp. 61-96.

Jackson, D.N. (1971). The dynamics of structured personality tests: 1971. Psychological Review, 78, 229-248.

Jackson, D.N. (1972). A model for inferential accuracy. Canadian Psychologist, 13, 185-195.

Jackson, D.N. (1974). The Jackson Vocational Interest Survey, Manual. Port Huron, MI: Research Psychologists Press.

Jackson, D.N. (1976). Jackson Personality Inventory. London, Ontario: Research Psychologists Press.

Jackson, D.N. (1976). Jackson Personality Inventory. Port Huron, MI: Research Psychologists Press.

Jackson, D.N. (1984). The Personality Research Form - E, Manual. Port Huron, MI: Research Psychologists Press.

Jackson, D.N. (1985). Multidimensional Aptitude Battery. Port Huron, MI: Research Psychologists Press.

Jackson, D.N., & Chan, D.W. (1980). Maximum-likelihood estimation in common factor analysis: A cautionary note. Psychological Bulletin, 88, 502-508.

Jackson, D.N., Holden, R.R., Locklin, R.H., & Marks, E. (1984). Taxonomy of vocational interests of academic major areas. Journal of Educational Measurement, 21, 261-275.

Jackson, D.N., & Mavrogiannis, A. (1987a). The Survey of Work Styles. Research Psychologists Press: London, Ontario, Canada.

Jackson, D.N., & Mavrogiannis, A. (1987b). An introduction to the Survey of Work Styles. Research Bulletin # 663, Department of Psychology, University of Western Ontario, Canada.

Jackson, D.N., & Messick, S.J. (1961). Acquiescence and desirability as response determinants on the MMPI. Educational and Psychological Measurement, 21, 771-790.

Jackson, D.N., & Messick, S.J. (1962a). Response styles and the assessment of psychopathology. In S. Messick & J. Ross (Eds.), Measurement in personality and cognition. New York: Wiley. Pp. 129-155.

Jackson, D.N., & Messick, S.J. (1962b). Response styles on the MMPI: Comparison of clinical and normal samples. Journal of Abnormal and Social Psychology, 65, 285-299.

Jackson, D.N., Paunonen, S.V., & Rothstein, M.G. (1987). Personnel executives: Personality, vocational interests, and job satisfaction. Journal of Employment Counselling, 23, 82-96.

Jackson, D.N., Peacock, A.C., & Holden, R.R. (1982). Professional interviewers' trait inferential structures for diverse occupational groups. Organizational Behavior and Human Performance, 29, 1-20.

Jackson, D.N., Peacock, A.C., & Smith, J.P. (1980). Impressions of personality in the employment interview. Journal of Personality and Social Psychology, 39, 294-307.

Jackson, D.N., & Williams, D.R. (1975). Occupational classification in terms of interest patterns. Journal of

Vocational Behavior, 6, 269-280.

Jahoda, M. (1981). Work, employment, and unemployment: Values, theories and approaches in social research. American Psychologist, 36, 184-191.

James, L.R. (1973). Criterion models and construct validity for criteria. Psychological Bulletin, 80, 75-83.

Jenkins, C. (1978). Behavioral risk factors in coronary artery disease. Annual Review of Medicine, 29, 543-562.

Jensen, A.R., & Reynolds, C.R. (1983). Race, social class and ability patterns on the WISC-R. Personality and Individual Differences, 3, 423-438.

Johansson, G. (1989). Job demands and stress reactions in repetitive and uneventful monotony at work. International journal of Health Services, 19, 365-377.

Johnson, E.W. (1988). Burnout - A Metaphoric Myth. American Journal of Physical Medicine & Rehabilitation, 67, 237-237.

Joreskog, K., & Sorbom, D. (1985). LISREL user's guide. Version VI. Chicago: International Educational Services.

Kacmar, K.M., & Ferris, G.R. (1989). Theoretical and methodological considerations in the age-job satisfaction relationship. Journal of Applied Psychology, 74, 201-207.

Kahn, R.L., & Quinn, R.P. (1970). Role Stress: A framework for analysis. In A. McLean (Ed.), Occupational mental health. Chicago: Rand McNally.

Kahn, R.L., Wolfe, D.M., Quinn, R.P., Snoek, J.D., & Rosenthal, R.A. (1964). Organizational stress: Studies in role conflict and ambiguity. New York: John Wiley and Sons.

Kane, J.S., & Bernardin, H.J. (1982). Behavioral observation scales and the evaluation of performance appraisal effectiveness. Personnel Psychology, 35, 635-641.

Kane, J.S., & Lawler, E.E. (1979). Performance appraisal effectiveness: Its assessment and determinants. In B.M. Staw (Ed.), Research In Organizational Behavior, 1, 425-478.

Kaplan, A. (1964). The conduct of inquiry. New York: Harper & Row.

Kaplan, B.H. (1988). Work stress - health-care systems in the workplace, by J.C. Quick, R.S. Bhagat, J.E. Dalton, & J.D. Quick. Contemporary Sociology - a Journal of Reviews, 17, 536-537.

Karren, R., & Bobko, P. (1983, August). Conducting utility analyses: Some methodological concerns. paper presented at the Academy of Management, Dallas, Texas.

Kavale, K.A., & Forness, S.R. (1984). A meta-analysis of the validity of Wechsler scale profiles and recategorizations: Patterns or parodies? Learning Disability Quarterly, 7, 136-156.

Kay, E., Meyer, H.H., & French, J.R.P. (1965). Effects of threat in a performance appraisal interview. Journal of Applied Psychology, 49, 311-317.

Keeley, M.A. (1978). A contingency framework for performance evaluation. Academy of Management Review, 3, 428-438.

Kelly, J.D. (1989). Gender, pay and job-satisfaction of faculty in journalism. Journalism quarterly, 66, 446-452

Kelman, H.C. (1972). The rights of the subject in social research: An analysis in terms of relative power and legitimacy. American Psychologist, 27, 989-1016-

Kennedy, P. (1988). The rise and fall of great powers. New York: Random House.

Kent, R. (July 14, 1990). You can't lead without managing. (Commentary: Despite a lot of talk about organizations being overmanaged and underled, those at the top need to be involved with what's happening down the line if they want their plans to succeed.) Globe and Mail, Business, B4.

Kidd, J.S. (1961). A comparison of two methods of training in a complex task by means of a task simulation. Journal of Applied Psychology, 45, 165-169.

Kilborn, P.T. (July 7, 1990). Brave new world seen for robots appears stalled by quirks and costs. New York Times, National, 14.

Kingsley, R.F., & Cookhatala, C. (1988). A survey of child-care workers - implications for administrators regarding job stress and satisfaction. Child & Youth Care Quarterly, 17, 281-287.

Kinmonth, E.H. (1981). The self-made man in Meiji Japanese thought. Berkley, CA: University of California.

Kirkcaldy, B., Thomas, W., & Thome, E. (1989). Job-satisfaction amongst psychosocial workers. Personality and Individual Differences, 10, 191-196.

Kirk, J. (1988). Trainers and job-satisfaction. Training and Development Journal, 42, 53-57.

Kirkpatrick, D.L. (1976). Evaluation of training. In R. L. Craig (Ed.), Training and Development Handbook (2nd ed.). New York; McGraw-Hill.

Kleiman, L.S., & Durham, R.L. (1981). performance appraisal, promotion, and he courts: A critical review. Personnel Psychology, 34, 103-121.

Koerner, J. (1973). Educational technology: Does it have a future in the classroom? Saturday Review Supplement, 5, 42-46.

Koeske, R.D. (1989). (1989). Work load and burnout - can social support and perceived accomplishment help? Social Work, 34, 243-248.

Konx, S.A., & Dickey, G.L. (1969), Manufacturing assembly instructions: A summary. Ergonomics, 12, 369-382.

Koop, C.E. (1992). America's failing health case system. Business Week, June, 67-92.

Kornhauser, A.W. (1965). Mental health of the industrial worker: A Detroit study. New York: Wiley.

Kornhauser, A.W., & Sharp, A. (1932). Employee attitudes: Suggestions from a study in a factory. Personnel Journal, 10, 393-401.

Kramer, M., & Hafner, L.P. (1989). Shared values - impact on staff nurse job-satisfaction and perceived productivity. Nursing Research, 38, 172-177.

Kuder, G.F. (1974). Occupational interest survey general manual. Chicgo, IL: Science Research Associates, Inc.

Kunin, T. (1955). The construction of a new type of attitude measure. Personnel Psychology, 8, 65-77.

Lahoz, M.R., & Mason, H.L. (1989). Maslach Burnout Inventory - factor structures and norms for usa pharmacists. Psychological Reports, 64, 1059-1063.

Landy, F.J., Barnes, J.L., & Murphy, K.R. (1978). Correlates of perceived fairness and accuracy of performance evaluation. Journal of Applied Psychology, 63, 751-754.

Landy, F.J., & Farr, J.L. (1980). Performance rating. Psychological Bulletin, 87, 72-107.

Landy, F.J., & Trumbo, D.A. (1980). Psychology of work behavior (rev. ed.). Chicago, IL: Dorsey Press.

Lanza, P. (1985). Team appraisals. Personnel Journal, 24, 47-51.

Latane, B., Williams, K., & Harkins, S.G. (1979). Many hands make light the work: The causes and consequences of social loafing. Journal of Personality and Social Psychology, 37, 822-832.

Latham, G.P., Fay, C.H., & Saari, L.M. (1979). The development of behavioral observation scales for appraising the performance of foremen. Personnel Psychology, 32, 299-311.

Latham, G.P., & Kinne, S.B. (1974). Improving job performance through training in goal setting. Journal of Applied Psychology, 59, 187-191.

Latham, G.P., & Pursell, E.D. (1975). Measuring absenteeism from the opposite side of the coin. Journal of Applied Psychology, 60, 130-135.

Latham, G.P., & Saari, L.M. (1979). The application of social learning theory to training supervisors through behavioral modeling. Journal of Applied Psychology, 64, 239-246.

Latham, G.P., Saari, L.M., & Fay, C.H. (1980). BOS, BES, and baloney: Raising Kane with Bernardin. Personnel Psychology, 33, 815-821.

Latham, G.P., & Wexley, K.N. (1977). Behavioral observation scales for performance appraisal purposes. Personnel Psychology, 30, 255-268.

Latham, G.P., & Wexley, K.N. (1981). Increasing productivity through Performance Appraisal, Reading, Mass.: Addison-Wesley.

Latham, G.P., Wexley, K.N., & Pursell, E.D. (1975). Training managers to minimize rating errors in the observation of behavior. Journal of Applied Psychology, 60, 550-555.

Latham, G.P., Wexley, K.N., & Rand, T.M. (1975). The relevance of behavioral criteria developed from the critical incident technique. Canadian Journal of Behavioural Science, 7, 349-358.

Latham, G.P., & Yukl, G.A. (1975). A review of research on the application of goal setting in organizations. Academy of Management Journal, 18, 824-845.

Lawler, E.E. (1971). Pay and organizational effectiveness: A psychological view. New York: McGraw-Hill.

Lawler, E.E. (1973). Motivation in work organizations. Monterey, CA: Brooks/Cole.

Lawler, E.E. (1982). Strategies for improving the quality of work life. American Psychologist, 37, 486-493.

Lawsche, C.H. (1959). Of management and measurement. American Psychologist, 14, 290-294.

Lay, C.H., Burron, B.F., & Jackson, D.N. (1973). Base rates and information value in impression formation. Journal of Personality and Social Psychology, 28, 390-395.

Lay, C.H., & Jackson, D.N. (1969). Analysis of the generality of trait inferential relationships. Journal of Personality and Social Psychology, 12, 12-21.

Lefkowitz, J. (1970). Effect of training on the productivity and tenure of sewing machine operators. Journal

of Applied Psychology. 54. 81-86.

Leiter, M.P. (1989). Conceptual implications of two models of burnout - a response. Group & Organization Studies. 14. 15-22.

Linn, J.G., Broomes, L.R., Whittenstovall, R., & Husaini, B.A. (1989). Community satisfaction, life stress, social support, and mental health in rural and urban southern black-communities. Journal of Community Psychology. 17. 78-88.

Linn, M.C. (1985). Gender equity in computer learning environments. Computers and the Social Sciences. 1(1), 19-27.

Locke, E.A. (1968). Toward a theory of task motivation and incentives. Organizational Behavior and Human Performance. 3, 157-189.

Locke, E.A. (1976). The nature and causes of job satisfaction. In M.D. Dunnette. (Ed.). The handbook of industrial and organizational psychology. Chicago: McGraw-Hill.

Locke, E.A. (1982). The ideas of Frederick W. Taylor: An evaluation. Academy of Management Review. 7, 7-24.

Locke, E.A. (Ed.). (1985). The generalizability of laboratory experiments: An inductive study. Lexington. MA: D.C. Heath.

Locke, E.A., Feren, D.B., McCaleb, V.M., Shaw, K.M., & Denny, A.T. (1980). The relative effectiveness of four methods of motivating employee performance. In K. Duncan, M. Gruneberg, & D. Wallis (Eds.). Changes in working life. Chichester, England: Wiley.

Locke, E.A., & Latham, G.P. (1990). A theory of goal setting and task performance. Englewood Cliffs, NJ: Prentice Hall.

Locke, E.A., & Schweiger, D.M. (1979). Participation in decisions-making: One more look. In B.M. Staw (Ed.). Research in Organizational Behaviour. 1, 425-478.

Locke, E.A., Shaw, K.N., Saari, L.M., & Latham, G.P. (1981). Goal setting and task performance. Psychological Bulletin. 90, 125-152.

Loevinger, J. (1957). Objective tests as instruments of psychological theory. Psychological Reports, 3, 635-694.

Loher, B.T., Noe, R.A., Moeller, N.L., & Fitzgerald, M.P. (1985). A meta-analysis of the relation of job characteristics to job satisfaction. Journal of Applied Psychology. 70, 280-289

Lomax, R.G. (1982). A guide to LISREL-type structural equation modeling. Behavior Research Methods and Instrumentation. 14, 1-8.

London, M., & Bray, D.W. (1980). Ethical issues in testing and evaluation for personnel decisions. American Psychologist. 35, 890-901.

Lord, R.M. (1963). Elementary models for measuring change. In C.W. Harris (Ed.). Problems in measuring change. Madison: University of Wisconsin Press.

Lowman, R.L. (Ed.). (1985). Casebook on ethics and standards for the practice of psychology in organizations. College Park, MD: Society for Industrial and Organizational Psychology, Inc., Division 14 of the American Psychological Association.

Lucas, M.D., Watkins, J.G., Mccreight, L.M., & Long, S.E. (1988). Job-satisfaction assessment of public-health nurses. Public Health Nursing. 5, 230-234.

Lundberg, U., Hansson, T., Granqvist, M., Wallin, L., & Magnusson, M. (1989). Psychological and physiological stress responses during repetitive work at an assembly line. Work and Stress, 3, 143-153.

Luthans, F., & Thomas, L.T. (1989). The relationship between age and job-satisfaction - curvilinear results from an empirical-study - a research note. Personnel Review. 18, 23-26.

Maier, N.R.F. (1976). The appraisal interview. LaJolla. CA: University Associates.

Makin, P.J., Cooper, C.L., & Rout, U. (1988). Job-satisfaction and occupational stress among general-practitioners - a pilot-study. Journal of the Royal College of General Practitioners. 38, 303-306.

Manpower and Immigration. (1974). The Canadian classification and dictionary of occupations. Ottawa, Ontario, Canada: Department of Supply and Services.

Martelli, T.A., Martelli, J., & Waters, L.K. (1989). The police stress survey - reliability and relation to job-satisfaction and organizational commitment. Psychological Reports. 64, 267-273.

Martin, J.K., & Shehan, C.L. (1989). Education and job-satisfaction - the influences of gender, wage-earning status, and job values. Work and Occupations. 16, 184-199.

Maslow, A.H. (1943). A theory of human motivation. Psychological Review. 50, 370-396.

Maslow, A.H. (1954). Motivation and personality. New York: Harper.

Matarazzo. J.D. (1972). Wechsler's measurement and appraisal of adult intelligence. (5th ed.). New York: Oxford University Press.

Mathieu. J.E.. & Leonard. R. L. (1987). Applying utility concepts to a training program in supervisory skills: A time-based approach. academy of Management Journal. 30. 316-335.

Mathieu. J.E.. & Tannenbaum. S.I. (1985). Supervisors' estimates of the dollar value of job performance: Some qualitative and quantitative findings. In. J.E. Mathieu (Chair) Estimating the utility of job performance: Examination and advancement. Symposium conducted at the meeting of the Southeastern Psychological Association. Atlanta GA.

Mayer. S.E.. & Bell. A.I. (1975). Sexism in ratings of personality traits. Journal of Personnel Psychology, 28. 239-249.

Mayfield. E.C. (1964). The selection interview: A re-evaluation of published research. Journal of Personnel Psychology. 17. 239-260.

Mayfield. E.C.. & Carlson. R.E. (1966). Selection interview decisions: First results from a long-term research project. Personnel Psychology. 19. 41-54.

McConkie. M.L. (1979). A clarification of the goal setting and appraisal process in MBO. Academy of Management Review. 4. 29-40.

McCord. J. (1985). Faculty responses to the computerization of a university. Special Issue: Social impact of computers. Computers and the Social Sciences. 1(3-4). 173-179.

McGarry. M. & Hill. T.D. (1995). A systematic approach to organizational expectations. Paper presented at the annual convention of the International Atomic Energy Association. Hartford. CT.

McGehee. W. (1979). Training and development theory. policies. and practices. In D. Yoder & H.G. Heneman. Jr. (Eds.). ASPA handbook of personnel and industrial relations. Washington. DC: Bureau of National Affairs.

McGee. R.A. (1989). Burnout and professional decision-making - an analog study. Journal of Counseling Psychology. 36. 345-351.

McGehee. W.. & Thayer. P.W. (1961). Training in business and industry. New York: Wiley.

McGregor. D. (1957). An uneasy look at performance appraisal. Harvard Business Review. 35, 89-94.

McMillan. C.J. (1984). The Japanese industrial system. Berlin: deGruyter.

McMullen. M.B.. & Krantz. M. (1988). Burnout in day-care workers - the effects of learned helplessness and self-esteem. Child and Youth Care Quarterly. 17. 275-280.

McNeely. R.L. (1989). Gender. job-satisfaction. earnings. and other characteristics of human-service workers during and after midlife. Administration in Social Work. 13. 99-116.

McNeely. R.L. (1989). Job-satisfaction and other characteristics among hispanic-american human-services workers. Social Casework -- Journal of Contemporary Social Work. 70. 237-242.

McNeely. R.L. (1989). race and job-satisfaction in human-service employment. Administration in social work. 13. 75-94.

McQuarrie. E.F. (1985). The computer imperative among owners of home computers: Explanation by social factors. Special Issue: Social impact of computers. Computers and the Social Sciences. 1(3-4). 155-161.

Medalie. J.H.. Snyder. M.. Groen. J.J.. Neufeld. H.. Goldbourt. U.. & Riss. E. (1973). Angina pectoris among 10.000 men: Five year incidence and univariate analysis. American Journal of Medicine, 55. 583-594.

Meehl. P.E. (1945). The dynamics of structured personality tests. Journal of Clinical Psychology. 1. 296-303.

Messick. S.J.. & Jackson. D.N. (1961). Acquiescence and the factorial interpretation of the MMPI. Psychological Bulletin. 58. 299-304.

Meyer. H.H.. Kay. E.. & French. .R.P. (1965). Split roles in performance appraisal. Harvard Business Review. 43. 123-129.

Mihalo. W.E. (1985). The microcomputer and social relationships. Special Issue: Social impact of computers. Computers and the Social Sciences. 1(3-4). 199-205.

Mikes. P.M.. & Hulin. C.L. (1968). Use of importance as a weighting component of job satisfaction. Journal of Applied Psychology. 52. 394-398.

Miner. J.B. (1980). Theories of organizational behavior. Hinsdale. IL: Dryden Press.

Miner. J.B. (1984). The validity and usefulness of theories in an emerging organizational science. Academy of Management Review. 9. 296-306.

Mirels. H.L. (1976). Implicit personality theory and inferential illusions. Journal of Personality. 44. 467-

487.

Mirvis. P.H.. & Lawler. E.E. (1977). Measuring the financial impact of employee attitudes. Journal of Applied Psychology. 61. 1-8.

Mirvis. P. H.. & Seashore. S.E. (1979). Being ethical in organizational research. American Psychologist. 34. 766-780.

Mitchell. T.R. (1985). An evaluation of the validity of correlation research conducted in organizations. Academy of Management Review. 10. 192-205.

Mook.D.G. (1983). In defense of external invalidity. American Psychologist. 38. 379-387.

Moore. M.L.. & Dutton. P. (1978). Training needs analysis: Review and critique. Academy of Management Review. 3. 532-545.

Morrison. J.H. (1976). Determining training needs. In R.L. Craig (Ed.). Training and Development handbook (2nd ed.). New York: McGraw-Hill.

Motowidlo. S.J.. Packard. J.S.. & Manning. M.R. (1986). Occupational stress: Its causes and consequences for job performance. Journal of Applied Psychology. 71. 618-629.

Muchinksy. P.M. (1977). Employee absenteeism: A review of the literature. Journal of Vocational Behavior. 10. 316-340.

Muldrow. T.W.. & Bayton. J.A. (1979). Men and women executives and processes related to decision accuracy. Journal of Applied Psychology, 64. 99-106.

Murphy. K.R. (1983). Fooling yourself with cross-validation: Single sample designs. Personnel Psychology. 36. 111-118.

Murphy. K.R. (1986). When your top choice turns you down: Effect of rejected offers on the utility of selection tests. Psychological Bulletin. 99. 133-138.

Murphy. K.R.. Martin. C.. & Garcia. M. (1981). Do behavior observation scales measure observation? Journal of Applied Psychology. 67. 562-267.

Nakase. T. (1979). The introduction of Scientific Management in Japan and its characteristics: Case studies of companies in the Sumitomo Zaibatsu. In K. Nakagawa (Ed.). Labour and management. Tokyo: University of Tokyo Press.

Nash. A. N.. Mucxyk. J.P.. & Vettori. F.L. (197:). The relative practical effectiveness of programmed instruction. Personnel Psychology. 24. 397-418.

Nayak. P.R. (July 7. 1991). Productivity and the white collar. New York Times. F11.

Naylor. J.C.. & Shine. L.C. (1965). A table for determining the increase in mean criterion score obtained by using a selection device. Journal of Industrial Psychology. 3. 33-42.

Nemeroff. W.F.. & Cosentino. J. (1979). Utilizing feedback and goal setting to increase performance appraisal interviewer skills of managers. Academy of Management Journal. 22. 566-576.

Nemeroff. W.F.. & Wexley. K.N. (1977). Relationships between performance appraisal characteristics and interview outcomes as perceived by supervisors and subordinates. Proceedings of the Academy of Management. 30-34.

Nisbet. J.. & York. P. (1989). Indexes of job-satisfaction of persons with moderate and severe disabilities. Education and Training in Mental Retardation. 24. 274-280.

Noe. R.A. (1986). Trainees' attributes and attitudes: Neglected influences on training effectiveness. Academy of Management Review. 11. 736-749.

Noe. R.A.. & Schmitt. N. (1986). The influence of trainee attitudes on training effectiveness: Test of a model. Personnel Psychology. 39. 497-523.

Novick. M.R.. & Ellis. D.D. Jr. (1977). Equal opportunity in educational and employment selection. American Psychologist. 32. 306-320.

Nunnally. J. (1978). Psychometric theory (2nd ed.). New York: McGraw-Hill.

Olson. D.A.. & Tetrick. L.E. (April. 1987). A multivariate analysis of a stress-support-satisfaction model. Paper presented at the Second Annual Conference of the Society for Industrial and Organizational Psychology. Atlanta.

Organ. D.W. (1977). A reappraisal of the satisfaction causes performance relationship. Academy of Management Review. 2. 46-53.

Orpen. C. (1974). Social desirability as a moderator of the relationship between job satisfaction and personal adjustment. Personnel Psychology. 27. 103-108.

Osborn. M.. Davis. L.. & Badick. S. (1988). Burnout in rehabilitation-medicine. American Journal of Physical Medicine & Rehabilitation. 67. 275-276.

Ouchi. W.G. (1981). Theory Z: How American business can meet the Japanese challenge. Reading, MA:

Addison-Wesley.

Overly. W.V. (1977). Why Johnny reads differently than Noriko. Educational Forum. 41. 236-245.

Packard. T. (1989). Participation in decision-making. performance. and job-satisfaction in a social-work bureaucracy. Administration in social work. 13. 59-73.

Palmore. E.B. (1969a). Physical. mental. and social factors in predicting longevity. Gerontologist. 9. 103-108.

Palmore. E.B. (1969b). Predicting longevity: A follow-up controlling for age. Gerontologist. 9. 242-250.

Palmore. E.B.. & Jeffers. F. (Eds.). (1971). Prediction of life span. Recent findings. Boston. MA: Health Lexington.

Parker. T.C. (1976). Statistical methods for measuring training results. In R.L. Craig (Ed.), Training and development handbook (2nd ed.). New York: McGraw-Hill.

Paunonen. S.V.. & Jackson. D.N. (1987). Accuracy of interviewers and students in identifying the personality characteristics of personnel managers and computer programmers. Journal of Vocational Behavior. 31. 26-36.

Pearce. J.L.. & Porter. L.W. (1986). Employee responses to formal performance appraisal feedback. Journal of Applied Psychology. 71. 211-218.

Pedhazur. E.J. (1982). Multiple regression in behavioral research. (2nd. ed.). Holt, Rinehart, and Winston: New York.

Pelsma. D.M.. Burry. J.M.. Harrington. R.G.. & Richard. G.V. (1989). The quality of teacher work life survey - a measure of teacher stress and job-satisfaction. Measurement and Evaluation in Counseling and Development. 21. 165-176.

Pelsma. D.M.. Burry. J.M.. Harrington. R.G.. & Richard. G.V. (1989). The Quality of Teacher Work Life Survey - A Measure of Teacher Stress and Job Satisfaction. Measurement and Evaluation in Counseling and Development. 21. 165-176.

Pelsma. D.M.. Wigington. H.. Tollefson. N.. & Roland. B. (1989). Parent Burnout - Validation of the Maslach Burnout Inventory with a sample of mothers. Measurement and Evaluation in Counseling and Development. 22. 81-87.

Perrolle. J.A. (1986). Intellectual assembly lines: The rationalization of managerial. professional, and technical work. Computers and the Social Sciences. 2(3), 111-121.

Perrow. C. (1979). Complex organizations. Glennview. IL: Scott. Foresman and Company.

Peters. C.H.. & Terborg. J.R. (1975). The effects of temporal placement of unfavorable information and of attitude similarity on personnel selection decisions. Organizational Behavior and Human Performance. 13. 279-293.Pollnac. R.B.. & Poggie. J.J. (1988). The structure of job-satisfaction among New Egland fishermen and its application to fisheries management policy. American Anthropologist. 90. 888-901.

Porter. L.W. (1961). A study of perceived need satisfaction in bottom and middle management jobs. Journal of Applied Psychology. 45. 1-10.

Porter. L.W. (1962). Job attitudes in management: I. Perceived deficiencies in need fulfillment as a function of job level. Journal of Applied Psychology. 46. 375-384.

Porter. L.W.. & Steers. R.M. (1973). Organizational. work. and personal factors in employee turnover and absenteeism. Psychological Bulletin. 80. 151-176.

Quinn. R.P.. & Staines. G.L. (1979). The 1977 quality of employment survey. Institute for Social Research. University of Michigan: Ann Arbor.

Rafaeli. S. (1986). The electronic bulletin board: A computer-driven mass medium. Computers and the Social Sciences. 2(3). 123-136.

Rahman. M. (1989). Job stress. satisfaction and mental-health of factory-workers in Bangladesh. Work and stress. 3. 155-162.

Raia. A.P. (1966). A study of the educational value of management games. Journal of Business. 39, 339-352.

Rapaport. E. (1980). Coronary artery disease. In the American Heart Association. The American Heart Association Heartbook: A guide to prevention and treatment of cardiovascular diseases. New York: E.P. Dutton. Pp. 176-186.

Raquepaw. J.M.. & Miller. R.S. (1989). Psychotherapist burnout - a componential analysis. Professional Psychology - Research and Practice. 20. 32-36.

Reed. P.L.. & Jackson. D.N. (1975). Clinical judgment of psychopathology: A model for inferential accuracy. Journal of Abnormal Psychology. 84. 475-482.

Reilly. R.R.. & Smither. J.W. (1985). An examination of two alternative techniques to estimate the standard deviation of job performance in dollars. Journal of Applied Psychology. 70. 651-661.

Rice. R.W.. Bennett. D.E.. & Mcfarlin. D.B. (1989). Standards of comparison and job-satisfaction. Journal of Applied Psychology. 74. 591-598.

Richardson. B.M.. & Ueda. T. (Eds.) (1981). Business and society in Japan. New York: Praeger.

Richardson. S. (1989). Social. ergonomic and stress aspects of work with computers. by G. Salvendy, L. Sauters. & J.J. Nurrell. Ergonomics. 32. 559-559.

Rimmerman. A. (1989). Burnout among beginning rehabilitation workers in Israel and its relationship to social support. supervision. and job-satisfaction. Rehabilitation Counseling Bulletin. 32. 243-247.

Roberts. M.. & Harris. T.G. (1989). Wellness at work - how corporations help employees fight stress and stay healthy. Psychology Today. 23. 54.

Robertson. I.. & Downs. S. (1979). Learning and the prediction of performance: Development of trainability testing in the United Kingdom. Journal of Applied Psychology. 64. 42-50.

Roche. W.J. (1965). A dollar criterion in fixed-treatment employee selection. In L.J. Cronbach & G.C. Gleser (Eds.). Psychological tests and personnel decisions (pp. 254-266). Urbana: University of Illinois Press.

Roe. A. (1956). The psychology of occupations. New York: Wiley.

Rogers. J.C.. & Dodson. S.C. (1988). Burnout in occupational therapists. American Journal of Occupational Therapy. 42. 787-792.

Ronan. W.W.. & Latham. G.P. (1974). The reliability and validity of the critical incident technique: A closer look. Studies in Personnel Psychology. 6. 53-64.

Ronan. W.W.. & Prien. E.P. (1971). Perspectives on the measurement of human performance. New York: Appleton Century Crofts.

Rose. C.L.. & Bell. B. (1971). Predicting longevity. Methodology and critique. Lexington, MA: Heath Lexington.

Ross. R.. & Glomset. J.A. (1976). The pathogenesis of artherosclerosis. New England Journal of Medicine, 295. 369-377. 671-676.

Rothstein. M.. & Chooi. C.M.M. (1990). Evaluating the impact of behavioral performance appraisal procedures and feedback: An experimental analysis. Paper presented at the annual convention of the Academy of Management. San Fransisco. CA.

Rothstein. M.G.. & Jackson. D.N. (1980). Decision making in the employment interview: An experimental approach. Journal of Applied Psychology. 65. 271-283.

Rudolph. B. (May 8. 1989). The man underneath the pines. Konosuke Matsushita: 1894-1989. Time, p. 102.

Ruscitti. J. (June 30. 1990). Standard Tube Canada. Plant closure announcement shocks unsuspecting town. The London Free Press. Sports & Business. B9.

Russell. J.S. (1984). A review of fair employment cases in the field of training. Personnel PsychoLogy, 37, 261-276.

Sales. S.M.. & House. J.S. (1971). Job dissatisfaction as a possible risk factor in coronary heart disease. Journal of Chronic Diseases. 23. 861-873.

Salloway. J.C.. Counte. M.A.. & Kjerulff. K. (1985). The effects of a computerized information system in a hospital. Special Issue: Social impact of computers. Computers and the Social Sciences. 1(3-4). 167-172.

Sarros. J.C. (1989). Sources of burnout among educators. Journal of Organizational Behavior. 10. 179-188.

Schmenner. R.W. (1987). Production/Operations management: Concepts and situations. 3rd ed. SRA: Chicago. (Pp. 702-715)

Schmid. H. (1989). Diagnosis of work loads. new data on stress management. Schweizerische zeitschrift fur psychologie-revue suisse de psychologie. 48. 204-205.

Schmidt. F.L.. & Hunter. J.E. (1977). Development of a general solution to the problem of validity generalization. Journal of Applied Psychology. 62. 529-540.

Schmidt. F.L.. & Hunter. J.E. (1978). Moderator research and the law of small numbers. Personnel Psychology. 31. 215-232.

Schmidt. F.L.. & Hunter. J.E. (1980). The future of criterion-related validity. Personnel Psychology. 33. 41-60.

Schmidt. F.L.. & Hunter. J.E. (1981). Employment testing: Old theories and new research findings. American Psychologist. 36. 1128-1137.

Schmidt. F.L.. & Hunter. J.E. (1983). Individual differences in productivity: An empirical test of the estimate derived from studies of selection procedure utility. Journal of Applied Psychology, 68. 407-414.

Schmidt. F.L.. Hunter. J.E.. McKenzie. R.. & Muldrow. T. (1979). The impact of valid selection procedures on work force productivity. Journal of Applied Psychology. 64. 609-626.

Schmidt. F.L.. Mack. M.J.. & Hunter. J.E. (1984). Selection utility in the occupation of U.S. Park Ranger for three modes of test use. Journal of Applied Psychology. 69. 490-497.

Schmitt. N. (1976). Social and situational determinants of interview decisions: Implications for the employment interview. Personnel Psychology. 29. 79-101

Seiss. T.F.. & Jackson. D.N. (1970). Vocational interests and personality: An empirical integration. Journal of Counselling Psychology. 17. 27-35.

Shore. L.M. & Martin. H.J. (1989). Job-satisfaction and organizational commitment in relation to work performance and turnover intentions. Human Relations. 42. 625-638.

Skinner. H.A. (1977). "The eyes that fix you": A model for classification research. Canadian Psychological Review. 18. 142-151.

Skinner. H.A.. Jackson. D.N.. & Hoffman. H. (1975). Alcoholic personality types: Identification and correlates. Journal of Abnormal Psychology. 83, 658-666.

Smith. P.B. (1975). Controlled studies of the outcome of sensitivity training. Psychological Bulletin. 82, 597-622.

Steiner. D.D.. & Truxillo. D.M. (1989). An improved test of the disaggregation hypothesis of job and life satisfaction. Journal of Occupational Psychology. 62. 33-39.

Stern. G.G.. Stein. M.I.. & Bloom. B.S. (1956). Methods in personality assessment. New York: Free Press of Glenco.

Stewart. H.R. (1989). Job-satisfaction of women in nontraditional occupations. Journal of Employment Counseling. 26. 26-34.

Strasberger. E.L.. & Jackson. D.N. (1977). Improving accuracy in a clinical judgment task. Journal of Consulting and Clinical Psychology. 45. 303-309.

Strasser. S.. & Bateman. T.S. (1984). What we should study, problems we should solve: Perspectives of two constituencies. Personnel Psychology. 37. 77-92.

Stricker. L.J.. Jacobs. P.I.. & Kogan. M. (1974). Trait interrelations in implicit personality theories and questionnaire data. Journal of Personality and Social Psychology, 30. 198-207.

Suppes. P.. & Morningstar. M. (1969). Computer-assisted instruction. Science. 166. 343-350.

Sussman. M.. & Robertson. D.U. (1986). The validity of validity: An analysis of validation study designs. Journal of Applied Psychology. 71. 461-468.

Sweeney. J. (1973). An experimental investigation of the free rider problem. Social Science Research. 2, 277-292.

Tao. M. (1984). Moderating effects of interpersonal variables on the relationship between job characteristics and internal motivation. Japanese Journal of Psychology. 55. 15-21.

Taylor. F.W. (1911). The principles of scientific management. New York: Harper and Brothers Publishers.

Taylor. H.C.. & Russell. J.T. (1939). The relationship of validity coefficients to the practical effectiveness of tests in selection. Journal of Applied Psychology. 23. 565-578.

Tetrick. L.E.. & LaRocco. J.M. (1987). Understanding, prediction, and control as moderators of the relationship between perceived stress, satisfaction, and psychological well-being. Journal of Applied Psychology. 72. 538-543.

Thorndike. R.L. (1971). Concepts of culture-fairness. Journal of Educational Measurement. 8. 63-70.

Thurow. L. (1992). Lessons for success: Skilled workers are tomorrow's only real asset. Challenges, 8-14.

Thurow. L. (Dec. 7. 1981). Where management fails. Newsweek, p. 78.

Topf. M. (1989). Personality hardiness. occupational stress, and burnout in critical care nurses. Research in Nursing & Health. 12. 179-186.

Tzeng. O.C.S.. Tzeng. C. (1982). Implicit personality theory: Myth or fact? An illustration of how empirical can miss. Journal of Personality. 50. 223-239.

Walker. R.M. (October. 1988). Investing in North America. Paper presented at the Osaka and Tokyo Conferece. Investing in North America: The human resources issues.

Wallbrown. F.H.. Blaha. J.. Wallbrown. J.D.. & Engin. A.W. (1975). The hierarchical factor structure for the Wechsler Intelligence Scale for Children - Revised. Journal of Psychology. 89. 223-235.

Wall. T.D. (1972). Overall job satisfaction in relation to "social desirability". age. length of employment.

and social class. British Journal of Clinical Psychology, 11, 79-81.

Wall, T.D., & Payne, R. (1973). Are deficiency scores deficient? Journal of Applied Psychology, 58, 322-326.

Walmsley, A. (1992). Trading places. Globe and Mail Report on Business. March, 17-26.

Walton, M. (1989). The Deming management method. W.H. Allen and Co.: Melbourne, Victoria.

Ward, E.A. (1988). Relation of job-satisfaction and job knowledge and their effect on intention to turnover. Psychological Reports, 63, 611-615.

Ward, E.A. (1989). A field-study of job knowledge, job-satisfaction, intention to turnover, and ratings of simulated performance. Psychological Reports, 64, 179-188.

Weekly, J.A., Frank, B., O'Connor, E.J., & Peters, L.H. (1985). A comparison of three methods of estimating the standard deviation of performance in dollars. Journal of Applied Psychology, 70, 122-126.

Welsh, P., Antoinetti, J.A., & Thayer, P.W. (1965). An industry-wide study of programmed instruction. Journal of Applied Psychology, 49, 61-73.

Wexley, K.N., & Snell, S.A. (1987). Managerial power: A neglected aspect of the performance appraisal interview. Journal of Business Research, 15, 45-54.

Whorley, L.W. (1989). Job-satisfaction among military prevention specialists. Journal of Drug Education, 19, 133-138.

Wiggins, J.S. (1973). Personality and prediction: Principles of personality assessment. Reading, Mass.: Addison-Wesley.

Wilhelm, P.G. (1989). Controlling work stress - effective human-resource and management strategies, by M.T. Matteson, J.M. Ivancevich. Academy of Management Review, 14, 460-462.

Williams, K., DeNisi, A., Blencoe, A., & Cafferty, T. (1985). The role of appraisal purpose: Effects of purpose on information acquisition and utilization. Organizational Behavior and Human Decision Processes, 35, 314-339.

Williams, L.K., Seybolt, J.W., & Pinder, C.C. (1975). On administering questionnaires in organizational settings. Personnel Psychology, 28, 93-103.

Wroten, S.P. (1984, August). Can supervisors really estimate SDy? In S.P. Wroten (Chair) Overcoming the futilities of utility applications: Measures, models, and management. Panel discussion conducted at the meeting of the American Psychological Association, Toronto.

Yate, M. (1993). Knock 'em dead: The ultimate job seeker's handbook. Holbrook, MA: Bob Adams, Incorporated Publishers.

Zahrly, J., & Tosi, H. (1988). Comparative-analysis of the influence of stress-related variables on adaptation to a new work setting. Psychological Reports, 63, 767-777.

Zenisek, T.J., & Rowney, J.I.A. (1980). A note on job satisfaction measurement. Canadian Journal of Behavioral Science, 12, 393-396.